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Pottsville Pa.

Sept. 8/87

1887.

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# The Coal Trade.

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By F. E. SAWARD.



P. W. SHEAFER,  
Pottsville, Pa.

Sept. 8, '87.

# THE COAL TRADE.

A Compendium of Valuable Information

—RELATIVE TO—

COAL PRODUCTION, PRICES, TRANSPORTATION, ETC.

AT HOME AND ABROAD.

With Many Facts Worthy of Preservation for Future Reference.

CORRECTED TO THE LATEST DATES.

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BY FREDERICK E. SAWARD,

EDITOR OF "THE COAL TRADE JOURNAL."

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1887.

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Fourteenth Consecutive Year of Publication.

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## PREFACE.

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We take pleasure in presenting the fourteenth annual edition of "THE COAL TRADE." It is as the title states, truly a compendium of valuable information relative to Coal Production, Prices, Transportation, etc. The uniform value and respectful consideration awarded the facts presented in these annuals—they are now esteemed by all the Government and State officials the most authoritative statements attainable of the Industry—has been such that the form and matter has been appropriated by certain individuals and public officers without due credit. The facts gathered to form this volume, as well as its predecessors, have been prepared and furnished for our use by parties well informed upon the subject matter, continued year by year, and may therefore be taken as official. To these gentlemen, whether their names be mentioned in the body of the work or not, we extend our cordial thanks for their valued aid in making the volume interesting. The reader may be assured that the figures are reliable in every instance. To avoid the charge of wearisome iteration the comparative statements of tonnages have been, in the main, reduced to periods of five years. We think this point will be appreciated. The arrangement of the matter in this volume will also be found an improvement over preceding yearly issues. This book is duly protected by copyright, and all excerpts by any one must be duly credited.

F. E. S.



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## PRODUCTION OF COAL IN THE WORLD.

The following table shows the total output for the calendar years of which statistics are available. Gross tons of 2,240 pounds are used in giving the statistics of Great Britain, the United States, Russia, and other countries, and metric tons, of 2,204 pounds, for all the other continental countries of Europe.

Countries.	Tons, 1884.	Tons, 1885.
Great Britain.....	160,757,779	159,351,418
United States.....	99,443,062	102,124,553
Germany.....	63,945,416	78,266,288
France.....	21,334,000	21,000,000
Belgium.....	18,051,499	17,437,603
Austria and Hungary.....	17,199,517	17,191,000
Russia.....	4,200,000	4,500,000
Spain.....	952,950	1,000,000
Nova Scotia.....	1,261,650	1,254,510
Other Countries.....	7,000,000	7,000,000
Total.....	394,145,873	409,125,372

### AUSTRIA.

Year.	Tons.	Year.	Tons.
1881.....	16,000,000	1884.....	17,199,517
1882.....	15,555,292	1885.....	17,191,000
1883.....	17,047,961		

### BELGIUM.

Year.	Tons.	Year.	Tons.
1881.....	16,873,551	1884.....	18,051,499
1882.....	17,590,989	1885.....	17,437,603
1883.....	18,177,754	1886.....	17,253,144

### BRITISH COLUMBIA.

Year.	Tons.	Year.	Tons.
1881.....	228,000	1884.....	394,070
1882.....	284,000	1885.....	365,000
1883.....	216,184	1886.....	326,635

## FRANCE.

Year.	Tons.	Year.	Tons.
1881.....	19,765,983	1884.....	21,334,000
1882.....	20,843,332	1885.....	21,655,000
1883.....	21,270,533		

## GREAT BRITAIN.

Year.	Tons.	Year.	Tons.
1881.....	154,184,300	1884.....	160,757,777
1882.....	156,499,977	1885.....	159,351,418
1883.....	163,737,327		

The exports have been as below :—

Year.	Tons.	Year.	Tons.
1881.....	19,591,593	1884.....	23,350,230
1882.....	20,958,324	1885.....	23,767,275
1883.....	22,775,634	1886.....	23,284,960

The exports in 1886, noted above, do not include 6,698,238 tons for use of steamers engaged in foreign trade.

## NEW SOUTH WALES.

Year.	Tons.	Year.	Tons.
1881.....	1,775,224	1884.....	2,749,109
1882.....	2,119,282	1885.....	2,878,863
1883.....	2,521,457		

## NEW ZEALAND.

Year.	Tons.	Year.	Tons.
1881.....	337,262	1884.....	480,831
1882.....	378,272	1885.....	500,000
1883.....	421,764		

## NOVA SCOTIA.

The total output of coal, is stated by Mr. Edwin Gilpin, to have been as below :

Year.	Tons.	Year.	Tons.
1882.....	1,365,811	1885.....	1,350,220
1883.....	1,422,553	1886.....	1,500,000
1884.....	1,389,295		

The tonnage reported as sold, is as below :

Total since beginning of the industry in the province in 1785 is put at 17,386,687 tons, to the beginning of 1881. Since then the sales have been :

Year.	Tons.	Year.	Tons.
1881.....	1,035,014	1884.....	1,261,650
1882.....	1,250,179	1885.....	1,254,510
1883.....	1,297,523	1886.....	1,373,666

The markets found for the coal produced, were as stated herewith :

Markets.	1884.	1885.	1886.
Nova Scotia.....	493,050	444,652	460,237
Quebec.....	393,782	493,917	538,762
New Brunswick.....	158,420	148,634	175,918
Newfound'and.....	86,216	74,322	71,476
Prince E. Island.....	50,500	52,770	49,168
United States.....	64,515	34,483	60,646
West Indies.....	9,595	5,732	16,721
Totals.....	1,261,650	1,254,510	1,373,666

## PRUSSIA.

Year.	Coal.	Lignite.
1881.....	48,688,161	12,852,324
1882.....	52,694,895	13,238,030
1883.....	50,617,938	11,872,189
1884.....	51,823,326	12,122,090
1885.....	65,879,004	12,387,284

## RUSSIA.

Year.	Tons.	Year.	Tons.
1881.....	3,412,397	1884.....	4,200,000
1882.....	3,600,000	1885.....	4,500,000
1883.....	4,000,000		

IMPORTS AND EXPORTS.

The following movement of coal is reported by the bureau collecting and compiling the returns of the several custom houses. The tariff from 1824 to 1843 was six cents per bushel, or \$1.68 per gross ton ; from 1843 to 1846, \$1.75 per ton ; 1846, 30 per cent. *ad valorem* ; 1847 to 1861, 24 per cent. *ad valorem* ; 1862 to 1864, \$1.00 per ton ; 1865, \$1.10 ; 1866 to 1872, \$1.25 per ton ; since August, 1872, 75 cents per ton. During the period from June, 1854, to March, 1866, the reciprocity treaty was in force, and coal from the British possessions in North America was admitted into the United States duty free.

The imports consist of Bituminous coal and some cannel, and are mainly from Australia and British Columbia to San Francisco ; from Great Britain to the Atlantic and Pacific coasts, and from Nova Scotia to Atlantic coast ports. The exports consist of Anthracite and Bituminous coals, mainly of Anthracite, to the Canadian provinces by rail over the international bridges, and by lake and sea to the same localities ; while the Bituminous is distributed also by lake vessels and rail connections to Canada, and by vessel from the coast points of shipment to the West Indies and some of the Central and South American countries. This trade is a growing one, and Mobile, Norfolk and Newport News add their quota to the shipments from the older ports of Baltimore, Philadelphia and South Amboy.

Coal Imported into the United States, 1881-6, inclusive.

Fiscal Years ending June 30.	Bituminous, in Gross Tons.
1881.....	652,963
1882.....	795,722
1883.....	645,924
1884.....	820,266
1885.....	817,600
1886.....	824,057

Coal Exported from the United States, 1881-6, inclusive.

Fiscal Years ending June 30.	Anthracite.	Bituminous.
1881.....	462,208	191,033
1882.....	553,742	314,320
1883.....	557,813	463,051
1884.....	649,040	646,265
1885.....	588,421	683,487
1886.....	682,975	532,846

All gross tons of 2,240 lbs.

The Canadian Customs Authorities report the following as the receipts in the fiscal years ending June 30:—

Year.	Anthracite.	Bituminous.	Total.
1883.....	727,256	835,345	1,562,601
1884.....	890,845	1,036,571	1,927,416
1885.....	907,962	971,315	1,879,277

COKE MADE IN THE UNITED STATES.

Mr. J. D. Weeks gives the following statistics of the manufacture of coke in the United States, 1883 to 1885 inclusive.

	1883.	1884.	1885.
Number of establishments.....	231	250	238
Ovens built.....	18,304	19,567	20,116
Ovens building.....	407	812	432
Coal used, short tons.....	8,516,670	7,951,973	8,071,126
Coke produced, short tons.....	5,464,721	4,873,805	5,106,696
Total value coke at ovens.....	\$8,121,607	\$7,242,878	\$7,629,118
Value coke at ovens, per ton.....	\$1.49	\$1.49	\$1.49
Yield of coal in coke, per cent... ..	64	61	63

IRON MADE BY THE FUEL USED.

Mr. J. M. Swank furnishes the statement below, which shows, in net tons, the quantity of pig iron produced in the United States in each of the years 1884-5-6. :—

	1884.	1885.	1886.
Bituminous.....	2,544,742	2,675,635	3,806,174
Anthracite.....	1,586,453	1,454,390	2,099,597
Charcoal.....	458,418	399,884	460,917
Total.....	4,589,613	4,529,869	6,366,688

Coke so largely enters now into the manufacture of Anthracite pig iron that it is stated that in 1886 only 443,746 net tons were made with Anthracite coal alone, the remainder being with mixture of Anthracite coal and coke.

## COAL PRODUCED IN THE UNITED STATES AND TERRITORIES.

The figures below are authentic, and fairly represent so many gross tons; while the returns from certain states are made in net tons there is always a large amount of coal used by local industries, the mining population, railroads in the districts, country banks for farmers' use, small mines that are not under the mine inspectors' regulations, and, in fact, a vast amount of supply coal that never gets into the returns. In the item of Anthracite we have given here the shipments, or commercial coal only.

	1884.	1885.	1886.
Alabama.....	2,000,000	2,225,000	2,500,000
Arkansas.....	150,000	175,000	175,000
California.....	200,000	150,000	150,000
Colorado.....	1,200,000	1,350,000	1,437,811
Dakota.....	50,000	75,000	30,000
Georgia.....	200,000	200,000	200,000
Idaho.....	20,000	40,000	40,000
Illinois.....	10,101,005	9,791,874	9,250,000
Indiana.....	2,260,000	2,375,000	3,000,000
Indian Territory.....	400,000	500,000	400,000
Iowa.....	3,903,458	3,585,737	4,000,000
Kansas.....	1,100,000	1,300,000	1,500,000
Kentucky.....	1,550,000	1,700,000	1,600,000
Maryland*.....	2,469,051	2,462,485	2,527,713
Michigan.....	35,000	30,000	40,000
Missouri.....	2,500,000	2,750,000	3,000,000
Montana.....	50,000	75,000	50,000
New Mexico.....	220,557	306,207	275,000
Ohio.....	9,000,000	9,000,000	9,500,000
Oregon.....	60,000	100,000	100,000
Pennsylvania Anthracite.....	30,718,293	31,623,529	32,136,362
“ Bituminous.....	25,000,000	25,000,000	27,000,000
Tennessee.....	1,200,000	1,440,597	1,700,000
Texas.....	125,000	175,000	125,000
Utah.....	250,000	250,000	200,000
Virginia.....	300,000	650,000	1,000,000
Washington Territory.....	380,698	410,667	378,147
West Virginia.....	3,000,000	3,483,457	4,000,000
Wyoming Territory.....	1,000,000	900,000	840,000
Totals.....	99,443,062	102,124,553	106,780,033

\*Coal over W. Va. Central Railroad to B. & O., duly credited to W. Va.

## PERSONS EMPLOYED IN THE COAL INDUSTRY.

The question is often asked, what number of persons are employed in and about the coal mines of the United States. We have taken the pains to arrive at an answer thereto, and give the result below. In thirteen cases they are the official figures of the mining bureaus of the States. The total is 232,300 persons.

Alabama.....	4,500	Missouri.....	2 500
Colorado ... ..	3,500	Ohio.....	21 000
Illinois.....	25 800	Tennessee.....	3,500
Indiana.....	6,400	Pa. Anth.....	94,000
Iowa.....	5,000	Pa. Bit.....	40 000
Kansas.....	4,000	West Virginia.....	7 300
Kentucky.....	4,200	Virginia.....	3,500
Maryland.....	5,500	Wyoming.....	1,500

## WAGES PAID FOR DIGGING COAL.

Alabama.....	50 cents per ton.
Allegheny Mountain, Pa.....	40 cents per ton.
Along the Monongahela.....	$2\frac{1}{4}$ @ $2\frac{3}{4}$ cents per bushel.
Angus, Iowa.....	90 cents per ton.
Anthracite regions.....	85 cents per 2 ton car.
Boulder, Colorado.....	$82\frac{1}{2}$ cents per ton.
Brazil, Indiana.....	80 cents per ton.
Brazil, Iowa.....	\$1.00 per ton.
Clarksburg, W. Va.....	45 cents per ton.
Clearfield region, Pennsylvania.....	50 cents per ton.
Connellsville Coke region.....	one cent per bushel.
Coos Bay, Oregon.....	\$1.00 per ton.
Elk Garden, West Virginia.....	50 cents per ton.
George's Creek, Maryland.....	50 cents per ton.
Hocking Valley, Ohio.....	60 cents per ton.
Indiana, block.....	80 cents per ton.
Indiana, Bituminous.....	65 cents per ton.
Kanawha River, West Virginia.....	$2\frac{1}{2}$ cents per bushel.
Kansas, average for State.....	6 cents per bushel.
Kentucky, Eastern.....	$.75$ @ $87\frac{1}{2}$ cents per ton.
Kentucky, Western.....	$.62\frac{1}{2}$ @ 75 cents per ton.
Missouri, Lexington.....	\$1.00 per ton.
Montevallo, Alabama.....	2 ft. coal, \$1.00 per ton.
Mt. Olive, Illinois.....	$56\frac{1}{2}$ cents per ton.
Myersdale, Pa.....	40 cents per ton.
Nova Scotia mines.....	38 cents per ton.
Ottumwa, Iowa.....	80 cents per ton.
Peoria, Illinois.....	70 cents per ton.
Pittsburgh, railroad pits.....	69 cents per ton.
Pocahontas, Va.....	45 cents per ton.
Reynoldsville, Pa.....	65 cents per ton.
Richmond, Missouri.....	4 cents per bushel.
Westmoreland, Pa.....	55 cents per ton.
What Cheer, Iowa.....	75 cents per ton.
Wilmington, Illinois.....	95 cents per ton.

At many places there is to be an advance of five cents per ton after May 1st.

## REVIEW FOR THE YEAR 1886.

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The coal industry of the United States has shown fair growth in the past year, but it is only fair to say that the business has been generally done at far below cost of production and delivery. In other words it was a year of extremely low prices ; the evidence of the first few months of the new year, however, goes to show that there will be a larger tonnage this year than in 1886, and it is more than likely to be at a profit. Wages are all upon a fair basis and no trouble is feared from this source ; arbitration and agreements appear to have settled all the vexed questions which so often arose in the past between employer and employee.

Anthracite trade conditions last year were most unsettled, and subject to wider fluctuations in price, than any year since the time of the auction sales. During January, February and March there was a larger production than in the three months in any preceding year. Late in the month of March some agreement was come to in respect of the production, and prices rallied from the low ebb to which they had fallen. During the next three months there was a constant effort on the part of the producer to bring the supply somewhat within the demand ; at the same time there seemed to be a determined effort to refrain from purchasing. As a natural consequence, the coal met with slow sales and a dropping of prices until the figures realized in July were as low as those during January ; the lowest rates were reached in March. During the month of July, and the first part of August, the gradual reduction in tonnage, overcoming the excess produced in the first quarter of the year, seemed to have an effect upon buyers, and the market took a turn for the better. Prices were advanced each month up to the first of October, and since that date they have remained nominally at the figures then made. At the time of the meeting in March it was thought that the probable requirements for the year from April to April would be in round numbers some thirty-three and a half millions of tons. This seems more than likely to be the amount which will actually be required. The percentages of the several sizes of coal made during the year, if figures could be obtained, would show that there was a steady growth in what are termed the domestic sizes. Egg, Stove and Chestnut now form the larger proportion of the entire output. There is a growing trade in Anthracite coal in all the interior cities and towns of the central and western states ; the amount delivered to tidewater is not nearly so large, in spite of the increased yearly tonnage, as before ; as

the northwest becomes settled, coal is the first requisite, it must be had from the easterly States of the Union, and the increasing trade in that direction is indicated by the growth of the coal trade at Duluth, Chicago, Cincinnati, Milwaukee, Toledo, Detroit and other centres.

The tonnage shows a total of 32,136,362 tons, an increase of some 500,000 tons over the preceding year, and of 1,400,000 tons over that of two years preceding ; from this bare statement it will be seen that there has been no restriction of the output. Prices have been lower than in four previous years, but 1886 closed with figures, which if continued, would give a very good average. The lowest prices were in March (duplicated in July), and the highest at the close of the year. There was apparently so much coal sold early in the year during the range of low prices, that the average for the year is a very low one ; the figures of the Philadelphia and Reading, the Lehigh Navigation, and the "Scranton averages" all showing a great reduction from preceding years. The east and west each had the benefit of these low figures, as the detailed information given will show. One of the important influences which brought about increased steadiness to the coal trade during the last few months of the year, was the improved condition of the iron trade. The "Anthracite" furnaces in blast on the first of January, 1887, numbered 131, as against 86, at the same date two years previously.

The production of Bituminous coal in all the States of the Union has been greater than heretofore ; the Ohio mines have done a larger tonnage, as also those of Colorado, Missouri, Kansas, Indiana, Iowa, Pennsylvania, Virginia, West Virginia, Alabama, Kentucky and Tennessee. For the fiscal year, the Illinois mining shows a slight falling off. There would have been a much larger tonnage had the railway facilities in the last three months of the year been at all adequate ; as it was the local trade and that of the Northwest went into the winter with light stocks on hand, causing a constant replenishment during January and February of this year. The importation of coal is not important, and the exports far outweigh them in amount ; the larger portion of the imports are to San Francisco and the Pacific coast. The exports are growing, and the shipments of both hard and soft coal to the Canadian provinces increase year by year. The Southern States are also in line for doing an export trade in coal from Mobile and New Orleans. There was an important increase in the number of furnaces in blast using Bituminous coal and coke ; the statistics showing that whereas there were 82 on the first of January, 1885, there were 114 on the same date in 1886, and 137 on the first of January, 1887.

The quantity of Bituminous coal marketed by rail and water to points east of the Alleghanies during the past year, may be set down in the aggregate at some ten million tons, of which it is safe to say that one-half was transferred at

the various loading ports on the coast (from Hampton Roads to South Amboy), and destined for use in the Atlantic States. An effort was made to come to some arrangement whereby the coal shipped from the tide-water ports would be sold for more than it had been. The discussion even went so far as an agreement between the roads on the question of tolls, but nothing came of it. This season opens with the formation of a pool which agrees to allot the several districts a tonnage or percentage equal to what has been done in the past, as an average. In the Cumberland and Clearfield districts there was a suspension of shipments on the 8th of March, owing to a demand for an advance in the price of mining the coal, of ten cents per ton. There was a six weeks' suspension of business, which accounts for the falling off in the tonnage from these two districts—to the advantage of the others, which kept at work. The Chesapeake and Ohio mines were run full all the year, and their output shows a large increase. The Pocahontas district, served by the Norfolk and Western Railroad, shows an increase. The Beech Creek district has grown in the greatest proportion during the past year. The Broad Top district also shows a larger production in the past year. Indications point to higher values; producers have become tired of the low prices realized under the severe competition, and wages will also be advanced. During the strike last spring, coal came into the Eastern market from many points west of the mountains, and even from some points in Ohio, and from Great Britain. The Erie road came in the Eastern market with its coal from Elk County, Pa., and has gained such a hold that in making up the pool for this year, it is allowed a percentage. All the evidence in hand shows a year of excellent import to the coal producer, carrier and workmen, during 1887.

Of the Anthracite coal mined and shipped during 1885, there were 4.17 per cent. used in the manufacture of textiles, for steam; there were 11.10 per cent. used in the manufacture of iron and steel; for miscellaneous uses (including coal for locomotive fuel) there were 19.58 per cent. The domestic trade took 65.15 per cent. The increased tonnage—500,000 tons—in 1886 was used to the extent of 70 per cent. for iron and steel, and 30 per cent. for domestic uses. The states of New York, New Jersey and Pennsylvania took 350,000 tons of the increased output, the Western States 100,000 tons, and the balance went principally to Canada. It is stated upon good authority that 150,000 tons of Anthracite coal for family use was displaced by natural gas in Pennsylvania and southwestern New York during the year 1886.

## ALABAMA.

The first coal mined in Alabama was near the University of Alabama, about the year 1834, and after that time for many years up to the advent of the central railroads through Alabama, or about ten years ago, much coal was taken up from the banks of rivers and creeks and shipped off in flat boats in time of high water. The census reports show that whereas 11,000 tons was the output in the census year ending in 1870, the quantity ten years later was 323,972 tons. The production is increasing rapidly of late years, as the following schedule will show :

Year.	Tons.	Year.	Tons.
1881.....	400,000	1884.....	2,000,000
1882.....	800,000	1885.....	2,225,000
1883.....	1,400,000	1886.....	2,500,000

In 1879 a great impetus was given to the coal industry by the opening up of the Pratt seam by the Pratt Coal & Iron Co. This coal is used for coke making, for gas and for steam, while the Helena seam is used for grate and coke purposes. It will thus be seen that the growth of coal mining in this State is but a repetition of the record of all the other coal bearing States in the southern portion of the Union. The statement is made that local iron industries consume about one and a quarter million tons annually.

During the past year there have been several railroad enterprises projected, looking to the development of coal in this State, and the distribution of the same. The coal and iron of this State has attracted much attention from northern capitalists and iron workers, as the two minerals here found bear an important part in the trade of the country, and can be produced more cheaply than in the other States.

In the past year, the subject of the improvement of the Warrior and Coosa Rivers, and the improvement of Mobile Harbor has been again discussed, and the aid of the United States Government has been asked. There is no doubt that considerable trade could be done in the coal of Alabama if the price for the mineral laid down in Mobile was a low one—sufficiently low to compete with coal at Baltimore or Norfolk, say \$2.00 per ton. There was a large increase, comparatively, in the coal shipped to Mobile and New Orleans, but even yet the aggregate is not 150,000 tons a year. Short roads from the coal fields to deep water on the rivers, would bring about a result much quicker than the improvement of the shoaler parts of the rivers, either with or without government aid.

Alabama coal mining furnishes a record of progress unsurpassed even by any Western State, and much of the progress has been due to the liberality of the Louisville and Nashville, the Great Southern, the Georgia Pacific, and the E. T. Va. & Ga. Roads, yet it may truly be said that the advantages which nature almost forced upon these lines were merely seized upon, with the usual result where shrewdness and business capacity go hand in hand.

Mobile is the only port on the continent to which coal can be transported by river tide. The distance from the Alabama coal fields to Mobile is 250 miles,

and, with the removal of certain obstructions to navigation, this coal could be transported by water at all seasons of the year. According to the testimony of officers of the U. S. Navy, Alabama coal is equal to any in the United States for steam purposes.

Alabama is the second coke maker and user, and the following are said to be the quantities produced :

Year.	Tons.	Year.	Tons.
1881.....	109,033	1884.....	244,009
1882.....	152,940	1885.....	301,180
1883.....	217,531	1886.....	360,000

A few analyses of the coal are appended :

	Pratt.	Coalburg.	Cahaba.	Patton.	Gaines.	Brady.
Moisture.....	1.07	.....	.....	1.28	1.551	2.702
Volatile matter.....	32.08	32.162	40.04	29.21	37.735	28.976
Fixed carbon.....	64.30	63.369	55.76	62.63	58.811	64.818
Ash.....	2.08	3.341	3.20	6.70	1.903	2.914
Sulphur.....	0.47	1.022	1.00	.18	.....	.690

The indications for 1887 are very bright as to the coal mining industry of Alabama, as new iron furnaces and other iron manufacturing establishments are being erected in large numbers in and near Birmingham, Sheffield, Bessemer and other North Alabama points.

Some conservative reports put the output of coal at less than above figures, but we have returns of 1,474,621 tons of coal mined and sold, and this in addition to the coal for coke named above, would give the total nearly as we have made it.

## ALASKA.

A so-called Anthracite is reported at Saint John's Bay, 17 miles north of Sitka. At Killisnoo, on Admiralty Island, there are Bituminous coal seams, from which some coal has been mined, and from which one of the resident officials of the North West Trading Company obtains his regular supply of fuel ; but the seams are badly broken up, and the coal unfit for use under steam boilers.

## ARIZONA.

In Apache County, Arizona, vast measures of coal exist, but are yet undeveloped. The coal region embraces the northern division of Apache and that portion of Yavapai County north of the Little Colorado River. This coal bed also extends into New Mexico on the East, and Utah on the North. Mr. C. P. Stanton, who visited the fields, writes—" Close to Fort Defiance there is a vein 9 feet thick, and it seems to possess all the qualities of excellent Bituminous coal, and to rank next to Anthracite for domestic purposes. I see

no reason why it should not be pre-eminently useful for generating steam and for smelting purposes. This description will apply to all the coal in the Arizona coal basin. The next great bed of coal is situated almost twenty miles northwest from the Moqui Villages. It is 23 feet thick, and boldly crops out for a distance of three miles. The coal is close, compact, and forms a very hot fire. It resembles, in external appearance, the Pennsylvania Bituminous coal."

The Atlantic and Pacific Railroad passes a few miles south of this deposit in New Mexico, and the Company uses the coal for locomotive fuel. The main belt is nearly 50 miles north of the line. Mr. Patrick Hamilton, author of "*Resources of Arizona*" says:—"On Deer Creek, a tributary of the Gila, in Pinal County, Bituminous coal of an excellent quality has been discovered. The extent of the deposit is about four miles long by two miles wide. The veins are from three to eight feet thick. The coal makes excellent coke, and for domestic purposes is said to be unequalled."

The late survey of the San Carlos reservation brings these coal beds within its limits; and the work of development has consequently been stopped.

## ARKANSAS.

The coal field of Arkansas covers twelve counties, and has an area which has been variously estimated to be from 9,000 to 12,000 miles. It is a portion of the great Missouri field, but projects into Arkansas, not from Missouri, but from the portion of the field lying in Indian Territory, and, while broad as it enters the State, narrows rapidly to a point. The outcrops, showing coal from 4 to 7 feet thick, are nearly all found on the south side of the Arkansas River, in Sebastian County, and cover a territory from 12 to 18 miles wide, east and west, and 30 to 35 miles, north and south. On the north side of the river the coal shows a thickness of only a foot or two until Ozark, 30 miles from the west line of the state, there it approximates 4 feet, but rapidly thins until it runs out about 100 miles from the Indian Territory line, on the north side of the Arkansas River. The amount of Arkansas coal mined and shipped over the Little Rock & Fort Smith R. R. for the year ending December 31, 1885, was 35,583 gross tons, and in 1886, 45,000 gross tons. The attempted developments of this interest is a recent one, although a small amount has been mined each year for some time. There are three different regions where coal is mined. The Ouita mines, near Russellville, about seventy-five miles from Little Rock, a vein of about thirty inches, producing a most excellent coal for domestic purposes, and showing in combustion all the characteristics of Anthracite. The Spadra openings are about twenty-five miles further up the valley, and also producing an excellent domestic coal, somewhat softer than Ouita coal. The openings of Coal Hill, 15 miles further on, produce a coal from a four-foot seam of most excellent quality, either for steam or domestic purposes. A branch road has been built from Coal Hill to the mines of the Ouita Coal Company, where coal cutting machinery has been introduced, and it is hoped that this will enable these coals to be marketed in the Mississippi Valley in competition with Pittsburgh and other coals. The Coal Hill mines of the Ouita Coal Company are worked with

convict labor. All other mines are worked with free labor. The amount of coal is, practically inexhaustible, and its excellent quality must, ere long, commend it to favor.

*Analysis of Arkansas Coal.*

	Ouita Coal.	Spadra Coal.
Volatile matter.....	12.66	10.70
Fixed carbon.....	80.46	84.10
Ash.....	5.11	1.40
Water.....	1.77	3.80
	100.00	100.00

It is safe to put the output of coal down for some 175,000 gross tons last year.

During the past year an important development of the coal interests of Arkansas has taken place through the Ouita Coal Company. By the efforts of the company Arkansas coal has become known in the markets outside the State, and it has come into successful competition with other coal at New Orleans and along the Mississippi River. Through the enterprise of this company magnificent possibilities of the coal interests of the State are being revealed.

The Ouita Coal Company last year did 46,092 tons, an increase of 20,000 tons over the preceding year; the company advise that they are rapidly opening and developing new trade; they are ready to supply any demand for coal. All the cities and towns in Arkansas are buying this coal, and sales have been made to points in Tennessee, Mississippi, Louisiana and Texas.

## CALIFORNIA.

There are reports from time to time of coal "finds" in this State. Upon investigation there is never much in these statements, for the coal is usually inferior, or found in such thin seams that it does not pay to be worked. The railroads passing other coal centers, and the sail and steam craft from the upper coast or foreign ports, bring better coal from great distances; and this forms the coast supply and that of interior points where coal is needed or can be obtained at a reasonable price. One of the recent developments is a mine at Pinacute, where a seven-foot vein was recently discovered, and, on a test being made by experts, the coal was found to be entirely suitable for smelting purposes. The A., T. & S. F. Railroad are owners. This mine is near the line of the California Southern, 100 miles from San Diego.

As will be noted, the Mount Diablo coal seam furnishes part of the supply of coal to San Francisco. This coal is mined at three points, but since the introduction of better coal from the other coast mines the demand has not been an increasing one; for the Mount Diablo coal is a lignite of poor quality, containing considerable sulphur.

At Ione Valley, Amador County, an inferior coal is found, containing 50

per cent. of moisture when first mined ; but there has been some development thereof.

At the McIntosh and Cheney deposit, in San Diego County, a good seam of coal, from four to seven feet in thickness, has been found, but it is not much better coal than the Mount Diablo. It sells largely in the vicinity.

At one or two other points in Mono and Los Angeles Counties there has been coal found, but of no great value, either commercially or geologically. While the receipts at San Francisco of coal mined in the State are not great, the total seems to be a growing one, and the coal from the coast collieries is displacing coal sent from the Atlantic coast and from Australia and Great Britain.

*Receipts of Coast Coals at San Francisco.*

	1883.	1884.	1885.	1886.
Mount Diablo, California.....	76,162	77,485	71,615	90,664
Coos Bay, Oregon.....	24,525	25,217	27,699	42,168
Seattle, Washington Territory.....	139,600	120,000	75,112	57,552
Renton, Washington Territory.....	24,386	32,413	57,604	73,654
South Prairie, Washington Territory.....	15,871	22,910	38,222	20,052
Carbon Hill, Washington Territory.....	137,420	136,896	157,241	124,529

*Total Receipts of Coal at San Francisco.*

Gross Tons.	1884.	1885.	1886.
Vancouver, (British Columbia).....	254,202	217,848	183,056
Welsh, Scotch, (Great Britain).....	138,295	182,998	166,937
Australian.....	153,192	167,567	198,081
Anthracite and Cumberland from Atlantic Ports.....	33,533	29,035	17,358
California, (Mount Diablo).....	77,485	71,615	90,664
Oregon, (Coos Bay and Newport).....	25,217	27,699	42,168
Washington Territory, (Seattle, South Prairie, Carbon Hill).....	311,027	328,179	319,140

There were some 26,293 tons of coke imported from Great Britain during the year 1886, and it sold at from \$11.00 to \$16.00 per ton. The coal from the seam found at Tacoma, worked by the Tacoma Coal Company, has been coked with good results ; and it can be laid down here at \$9.00 per ton and yield a handsome profit.

The output of Mount Diablo coal is gradually decreasing, as the receipts at San Francisco will show. We append details :

Year.	Tons.	Year.	Tons.
1871.....	133,495	1879.....	124,435
1872.....	177,222	1880.....	158,723
1873.....	171,741	1881.....	103,055
1874.....	206,455	1882.....	113,255
1875.....	142,808	1883.....	76,162
1876.....	108,078	1884.....	77,485
1877.....	96,172	1885.....	71,615
1878.....	122,034	1886.....	90,664

COLORADO.

The principal coal mines of Colorado are owned or controlled by the railway companies which enter the state. The companies operating on the largest scale and the corporate name under which they transact their mining operations are the following :

Denver and Rio Grande railway ; Colorado Coal and Iron Company. Union Pacific railway ; Union Coal Company. Burlington and Missouri River railway ; Colorado Fuel Company. Atchison, Topeka and Santa Fe railway ; Canon City and Trinidad Coal and Coking Companies. Denver and New Orleans railway ; New Orleans Coal Mining Company. Denver, Utah and Pacific railway ; Mitchell Coal Mining Company. Of these the largest is the Colorado Coal and Iron Company, which has its headquarters at South Pueblo, and controls mines in Fremont, Las Animas, Huerfano and Gunnison counties. It owns all the important coking coal veins in the State except that of the Trinidad Coal and Coking Company and those in Garfield County now operated on a limited scale. The shipments of coal by the Colorado Coal and Iron Company have been :

Year.	Tons.	Year.	Tons.
1873.....	12,187	1880.....	221,378
1874.....	18,092	1881.....	350,944
1875.....	15,275	1882.....	511,239
1876.....	20,410	1883.....	602,396
1877.....	34,410	1884.....	450,808
1878.....	82,140	1885.....	561,095
1879.....	120,102	1886.....	615,360

In 1886 there were 112,200 net tons of coke made and shipped=225,000 tons coal. Mr. F. F. Chisolm, of the United States Geological Survey, furnishes the following statement, aggregating 1,437,811 net tons, for the year 1886 :

NORTHERN DIVISION.—	
Erie and Canfield.....	104,645
Marshall.....	64,934
Louisville.....	55,896
Langford.....	24,652
Golden.....	10,018
CENTRAL DIVISION.—	
Franceville.....	53,000
Camo.....	23,823
Rockvale.....	205,212
Coal Creek.....	126,822
SOUTHERN DIVISION.—	
Trinidad and El Moro.....	429,706
Durango.....	18,166
NORTHWESTERN DIVISION.—	
Crested Butte.....	102,918
Baldwin.....	37,405
Glenwood.....	300
Wheeler.....	1,000
Four Mile.....	300
Crested Butte—Anthracite.....	19,623

We have the report that the A., T. & S. F mines produced in 1886 :

Canon City Coal Company, Rockvale..... 211,406 tons.  
Trinidad Coal and Coke Company, Starkville, (also 27,072 tons coke)..... 146,015 tons.

## THE COAL TRADE.

### *Analysis of Colorado Bituminous Coals.*

	Slate River.	Canon I.	Canon II.	Walsenburg.	Crested Butte.
Water.....	1.50	4.50	6.15	3.23	0.44
Volatile matter.....	22.80	34.20	36.03	40.93	24.17
Fixed carbon.....	68.70	56.80	52.82	49.54	72.30
Ash.....	7.00	4.50	5.00	6.30	3.09

### *Comparing with Pennsylvania Coal and Coke.*

Coal.	Water.	Vol. matter.	Fixed Carbon.	Ash.	Sulphur.
El Moro, Col. C. & I. Co.....	0.26	29.66	65.76	4.32	0.85
Connellsville, McCreath.....	1.25	30.11	59.62	8.23	0.78

Coke.	Fixed Carbon.	Ash.	Sulphur.
El Moro, Col. C. & I. Co.....	87.47	10.63	0.85
Connellsville, McCreath.....	89.57	9.11	0.82
Crested Butte, Col. C. & I. Co.....	92.03	6.62	....

The output in the years named has been :

Year.	Tons.	Year.	Tons.
1882.....	1,061,479	1885.....	1,398,796
1883.....	1,229,593	1886.....	1,437,811
1884.....	1,130,024		

This is said to include coal made into coke. The average value of the coal on the cars at the mines is \$2.35 per ton of 2,000 pounds. The average number of persons employed directly in and around the mines during the year is estimated at 3,500.

## DAKOTA.

Constant reports of coal discoveries in this Territory continue to be made, and it is reported that there is coal, in four-foot seams, equal to Illinois soft coal, in the country around the headwaters of the Moreau River, and between the Moreau and Grand Rivers. No practical business has been carried on to any extent. A total of 30,000 tons is credited for the year 1886, as against, say, 26,000 tons for the preceding year, the decrease being accounted for by the fact that better coal can be had in Montana, while the supply from Duluth is ample—of first-class coal at low prices. We have the report that some 30,000 tons of coal were produced in Dakota during 1886, of which 20,956 tons were mined by the N. P. R. R. Co. at the Sims mine. It is difficult to ascertain the total production of the territory, because much of the miscellaneous product is mined by farmers for their own use, and no records are kept.

## GEORGIA.

The coal-field of Georgia is found in the northwestern corner of the State, and is of comparatively small extent, covering only 170 square miles. It is formed by the passing across of a portion of the Appalachian field on its way from Tennessee into Alabama. There is only one mine in operation in the State, and the coals, which are similar to those found in adjacent parts of Tennessee and Alabama, go to supply the local trades. The product is small, being estimated at 200,000 tons for 1886.

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## IDAHO.

Bituminous coal and lignites, some of which burn well, have been found at many points in Idaho. In the Squaw Creek country, twenty miles from Boise City, the outcrop of good coal is found over a district twelve miles square. The coal has been tested and has proved excellent. A company has been formed to carry on mining operations in the district, and contracts could readily be placed for it. This coal may be possibly used extensively at the smelters in the vicinity of Wood River.

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## ILLINOIS.

This State contains the greater part of the Illinois coal field, a very large proportion of its surface being underlaid by the coal measures. The field is longest from northwest to southeast, the eastern side spreading over a considerable portion of Indiana and the southeastern extremity passing across the Ohio into Kentucky. The coal measures, as in the Appalachian system, contain repeated alternations of sandstone, shales, bituminous slate, thin bands of limestone, and seams of coal, with the under clays which usually accompany them. In southern Illinois, they attain an aggregate of from one thousand, two hundred to one thousand, four hundred feet, while in the northern portion of the State their entire thickness does not exceed six hundred or eight hundred feet. The conglomerate sandstone at the base of the true coal measures must be considered with the latter, for the reason that they contain, as in other States, coal seams of workable thickness, which shade into the true coal measures in such a manner that it is difficult to fix any dividing line between them. In the southern part of the State, these conglomerate coal measures are from two hundred to three hundred feet in thickness, and at some points contain well defined coal seams, though generally local in their character.

In regard to the commercial features of the coal trade in this State, trade was not good so far as a demand for coal was concerned, until the fall months, while at the same time there was an endeavor to reduce cost by increasing the capacity of mines and reducing wages. There was, moreover, a diversion of unusual quantities of Bituminous coal from Pennsylvania to western markets, occasioned by the utilization of natural gas as a fuel in many of the mills and

manufactories of that State; and Ohio and Indiana coal was sent in large quantities to distributing points in the west, thus throwing all producers into active competition for contracts, and pushing them into new fields of operation to the utter demoralization of the prices of fuel. A recovery took place in the fall of 1886, and the outlook for this year is of better prices and increased output.

Below are the statistics for the fiscal years, ending with June 30, 1884-86, as furnished in the reports of Mr. John S. Lord.

Details.	1884.	1885.	1886.
Counties producing.....	49	50	50
Number of mines.....	741	786	789
Employees.....	25,575	25,446	25,846
Coal mined.....	10,101,005	9,791,374	9,246,435
Average value.....	\$1.30	\$1.17	\$1.11
Average days worked.....	200	225	206
Average price for mining (cents per ton).....	.82	.72½	.67½
Fatalities.....	46	39	52
Tons mined to each fatality.....	219,587	251,073	177,816

Shipments by Districts in the Years Named.

Years.	I.	II.	III.	IV.	V.
1880.....	1,631,440	696,046	1,185,189	1,022,718	1,579,984
1882.....	2,540,532	710,526	1,350,020	2,075,244	2,412,321
1883.....	2,495,072	831,522	1,585,108	3,128,368	1,990,921
1884.....	2,507,370	728,341	1,932,881	3,804,183	2,128,230
1885.....	2,519,397	723,077	1,811,405	2,615,992	2,122,003
1886.....	2,326,742	704,723	1,518,445	2,749,813	1,946,712

Shipments from the Braidwood field, in the calendar year 1886, were 1,026,-550 tons.

Analyses of Some Illinois Coals.

Designation.	Water.	Ash.	Volatile Matter.	Fixed Carbon.
Bloomington, McLean County.....	7.90	4.96	34.02	53.12
Blair Bluff, Henry County.....	12.60	9.90	28.96	48.54
Barclay, Sangamon County.....	10.80	17.10	27.32	44.78
Carbondale, Jackson County.....	6.36	7.40	26.40	59.84
Catlin, Vermilion County.....	7.80	12.70	31.08	48.42
Danville, Vermilion County.....	9.60	14.64	31.20	44.56
DuQuoin, Perry County.....	8.86	7.00	23.54	60.60
Elmwood, Peoria County.....	7.60	9.50	27.60	55.30
Farmington, Fulton County.....	8.52	11.72	29.28	50.48
Grape Creek, Vermilion County.....	9.74	10.60	28.34	51.32
Kewanee, Henry County.....	15.60	7.14	27.60	49.66
Lincoln, Logan County.....	10.92	14.84	27.60	46.64
Lombardville, Stark County.....	9.42	7.46	31.38	51.74
Mount Carbon, Jackson County.....	6.12	2.70	24.68	66.50
Oglesby, La Salle County, second vein.....	12.12	7.72	30.84	49.32
Oglesby, La Salle County, third vein.....	10.06	3.72	30.34	55.88
Peru, La Salle County, second and third veins.....	10.30	4.54	33.90	51.26

The prospect is of a larger year's business, as the labor bureau says:—The present disposition is manifestly to contest for a place in all accessible markets. Large sums of money invested in coal property, demand protection, and this necessity stimulates special business activities. One consequence of this is the recent tendency to organize powerful combinations with such resources and

facilities as to enable them to compete with all producers and command a share of all business.

The output has been as below.

Year.	Tons.	Year.	Tons.
1882.....	9,000,000	1885.....	9,800,000
1883.....	10,350,000	1886.....	9,250,000
1884.....	10,000,000		

INDIANA.

Indiana contains part of the southeastern end of the Illinois coal-basin, the lines of the basin passing on across the Ohio some distance to their terminus in Western Kentucky. The productive coal lands of the State have an area of about 250,000 acres, the coal-producing rocks being found in the counties of Posey, Vanderburg, Warwick and Spencer; the western parts of Perry and Crawford; in Gibson, Pike, Dubois, Knox. Daviess, Martin, Sullivan, Greene and Clay; the western part of Owen, and in Vigo, Parke, Vermillion, Fountain and Warren, with a projection in a narrow band of coal-measure rock (conglomeratic sandstone), underlaid by thin beds of Keokuk limestone and knowstone shales of the lower carboniferous group, extending from the northern part of Warren County in northeasterly direction, across Benton, and terminating near Rensselaer, in Jasper County, where the Conglomerate is massive. Clay, Daviess, Dubois, Fountain, Perry, Parke and a few others contain the bulk of the mining operations.

These counties lie among the western border of the State, where the fuel belt stretches a length of 200 miles with a width varying from 10 to 35 or 40 miles. By the report of the Inspector of mines for last year, it appears that the tonnage of coal mined for the year ending October 31 last, was 3,000,000 tons. Of this amount fully 800,000 tons were Block coal from the Brazil district, the average price for mining which was 80 cents a ton. The remainder of the coal output is semi-block, Bituminous and cannel, in proportions unknown, the average price for mining which may be nearly correctly stated at 65 cents.

The following analyses show the character of the Indiana coal :

Localities.	Fixed Carbon.	Volatile Matter.	Water.	Ash.
Fountain County.....	54.5	36.0	5.0	4.5
Vanderburg County.....	48.5	42.0	3.5	6.0
Warwick County.....	49.5	41.5	3.5	5.5
Posey County.....	51.0	39.5	4.0	5.5
Sullivan County.....	55.0	40.0	3.5	1.5
Daviess County.....	53.5	36.0	5.5	5.0
Vermillion County.....	46.0	44.0	5.5	4.5
Parke County.....	46.5	46.0	4.0	3.5
Montgomery County.....	52.0	41.5	3.0	3.5
Clay County.....	61.5	32.5	3.5	2.5
Owen County.....	57.5	38.5	2.0	2.0
Greene County.....	63.0	29.5	7.0	0.5

Production of coal in Indiana has been as below :

Year.	Tons.	Year.	Tons.
1881.....	1,771,596	1884.....	2,260,000
1882.....	1,976,470	1885.....	2,375,000
1883.....	2,560,000	1886.....	3,000,000

During 1886, there were 208 mines opened up, and 6,406 men were said to be employed, of which 2,600 were in Clay County alone. The increased railway facilities will give the operators an opportunity to make an increase in the business done, and it is expected that prices will be higher.

### INDIAN TERRITORY.

There is said to be an area of upwards of twelve thousand square miles of coal measures within this territory. The McAlister mines and those at Savanna are the only important works, and their output runs up to four hundred thousand tons of coal per year of late.

The following analysis shows the composition of the McAlister coal and cokes.

	Coal.	Coke.
Water.....	2.10	0.325
Volatile matter.....	29.71	1.560
Carbon.....	62.67	87.140
Ash.....	5.52	9.975
	100.00	100.000

### IOWA.

The middle coal measures outcrop chiefly along the line of the Des Moines river, throughout a belt of country some 50 miles in width, passing through some nine counties. These measures contain all the larger beds of coal, and, in fact, the most of the coal of any commercial importance found within the limits of the State. The line within which the outcrop of the Lower Coal Measures is found is very irregular, but in general does not depart far north-east of the line of the Des Moines river. Keokuk, Mahaska, Marion, Monroe, Wapello, Lucas, and Webster counties, have coal ranging from five and a half to nine feet in thickness, whilst all the other coal producing counties, with the exception of the western portion of the State, have coal from three to four feet in thickness. This portion referred to includes Page, Taylor, Adams and Cass counties, in which is being worked the surface vein. Beyond doubt in a few years Iowa will become a coal mining state of no small magnitude. A few years since the State was considered to have no coal to amount to anything, but, as

may be noticed, there is a yearly increase, and the coal finds a ready and fairly profitable market.

As Mr. P. C. Wilson, the late mine inspector, said: "There are certain localities that geographically belong to Iowa, but by a system of discrimination in freight rates and by rebate of freights, other states have been enabled to come into successful competition with the coal from Iowa mines, and in some instances have been enabled to undersell our Iowa coal in the markets."

The following statement shows the production in Iowa:

Year.	Tons.	Year.	Tons.
1881.....	1,750,000	1884.....	3,903,458
1882.....	2,500,000	1885.....	3,555,737
1883.....	3,881,300	1886.....	4,000,000

### KANSAS.

The workable coal beds in the State of Kansas, so far as discovered, are limited to a very small portion of the State, covering an area of about 17,000 square miles. The same three divisions occur here as in Iowa and Missouri, and the measures are about 2,000 feet in thickness. In these measures 22 different seams of coal have been found, varying from a few inches to seven feet in thickness; ten of these are over a foot thick. In some portions of the State the coal is mined by stripping, and is of superior quality, being rich in Bituminous matter, and is a very good gas and blacksmithing coal, being free burning, and containing no sulphur. The largest amounts have been mined near Fort Scott, where it is very near the surface, but workings extend along the southeast portion of the State, in Cherokee and Crawford Counties. In the latter county this vein has been discovered 120 feet deep, and is now being mined at that depth. The market for this coal is found in many cities in Eastern Kansas and Nebraska, and Western Iowa and Missouri. Search for coal all over the State is being made, and many finds are reported. Near Oswego one can see beds of coal in the bottom of the Neosho River, and higher up in the bluffs two veins jutting out. The Penitentiary Shaft at Leavenworth, at a depth of 400 feet, passed through the upper coal measures, and at 700 feet found rich paying coal of the lower measures.

Within a few miles of Centralia there are beds of coal belonging to the upper coal measures, but in general the soil is too loose and porous to permit of sinking a shaft, and too deep for stripping. Near Seapo, Republican County, coal mines have been in operation for the past eight or ten years. Coal at these mines ranges in price from \$1.50 to \$3.00 per ton. Kansas is, as yet, but a young State, but in the near future is certain to attain some pre-eminence, especially in the mining of coal. The output last year, was larger than ever, and the prospects are for a continuance. Coal is reported as having been found recently at Emporia, at Pratt Center, at Newton, at Paola, at Marion, at Peabody, and many other points, and all tends to the increased output and consumption of coal in this State. A late report says that 9,375

square miles of coal area have been proven, with a third of the State to hear from.

The production of coal in Kansas has been :

Counties.	Bushels, 1885.
Cherokee.....	9,260,681
Osage.....	5,387,920
Crawford.....	3,832,717
Leavenworth.....	3,014,024
Franklin.....	344,952
Neosho.....	191,500
Linn.....	113,911
Cloud.....	102,948
Nine others in small amounts.....	430,407
	22,679,060
To which may be added for "stripped" coal.....	3,370,576
Also, by farmers.....	1,000,000
	27,049,636

In 1884 the product was 27,500,000, and for 1886 we have estimates of 30,000,000 bushels.

### KENTUCKY.

In this state are found portions of two coal fields. The Appalachian system crossing the eastern boundary, and the Illinois field projecting into the western portion of the State.

The East Kentucky division of the Appalachian field is the westward extension and outcrop of the West Virginia coals. While in a small area much work has been done, it can fairly be stated that the region wherein exists the best coal and the greatest quantity has not yet been even fully explored, from the fact that it is not accessible to any railroad transportation. The road now in progress, called the Kentucky Union, will develop a portion of it.

The West Kentucky coal field is, perhaps, the best developed in the south. It is cut across north and south, and east and west by the Louisville and Nashville, and Chesapeake and Ohio Railroads. It is a regular basin field, and all the mines are worked from slopes or shafts, and have to be pumped. Only two seams of this field have been worked, while there are many more, and some think in the western part that a coking coal exists.

Coal mining, as an important industry in this State, dates, practically, from 1870. The output of all the mines in the State for that year amounted to only 169,120 tons; in 1880 it had grown to 1,120,000 tons, and in 1884 the output of only such mines as came under the supervision of the Mine Inspector amounted in round numbers, to 1,550,000 tons. But even now, hardly more than a beginning has been made. The total output for the year 1885 was 1,600,000 gross tons. As stated above there are mines that do not come under the supervision of the Mine Inspector, and from returns received there was sufficient to make the above quantity.

The Jellico is an important coal district, not so much from the present amount mined, as its future in the development of the region further east by construction of branch railroads. The strata all dips slightly to the southeast, back in that direction rise high mountains which contain coal seams not here existing, and that region is made accessible up Laurel Fork, the Cumberland and lesser streams, and while it will be many years before all the coal at Altamont will be exhausted, yet future development on a large scale must look

farther east and southeast for material, and there it will be found in abundance.

During the past year there has been quite a trade opened up in the Breckinridge cannel coal. Its good qualities are well-known as an enricher for gas making. Some coal has been shipped to England via New Orleans. A railroad from Cloverport to Louisville would give the district better shipping facilities. The seam of coal is only thirty inches at the thickest point. In Breathill County, ten miles above Jackson, a seam of even better cannel is said to have been found which averages 46 inches in thickness.

We have the following details of the production of the western coal field :

	Tons, 1884.	Tons, 1885.	Tons, 1886.
Mines on Henderson div. of L. & N.....	340,887	357,745	423,375
Mines on C. & O. and S. W. Railroad.....	292,071	282,660	299,868
Mines on Green River.....	118,000	73,000	80,000
Mines on Ohio River below Green River.....	62,000	75,000	70,000
Mines on Ohio River above Green River.....	66,000	70,000	70,000
Grand Total.....	878,958	863,405	943,243

Mr. C. J. Norwood states the output as having been as follows in 1885:

	Tons.
Western coal field.....	860,000
Southeastern coal field.....	400,000
Northeastern coal field.....	280,000

The production has been as below :

Year.	Tons.	Year.	Tons.
1882.....	1,300,000	1885.....	1,600,000
1883.....	1,650,000	1886.....	1,600,000
1884.....	1,550,000		

The Clifton Coal Company have put 34 ovens and a Stutz coal washer at Mannington, Hopkins County, and made 1,500 tons of coke last fall, and the coke is good. The output for 1887 has already been sold. Experiments have been renewed at the St. Bernard mines. At the Dovey, Mud River, Bevier and Render mines the making of coke is to be experimented with this year. The mine inspector notes the output of the mines coming under his charge, during 1886, to have been 1,550,000 tons.

MARYLAND.

The most important semi-Bituminous coal district which supplies the Atlantic seaboard is the Cumberland (George's Creek), coalfield, located in Alleghany county, at the western extremity of the State. The field is about four miles wide along the Baltimore and Ohio Railroad, where cut by the Savage River, and the northern branch of the Potomac, and extends thence for some 30 miles northeast, and across the State line of Pennsylvania, decreasing in breadth until it dies out. This field is limited in extent, but derives its important position from the great thickness of its main coal vein and the purity of the fuel contained therein. The coal, which is known widely as Cumberland or George's Creek coal, is Bituminous and of a superior

quality. By actual survey, it has been ascertained that the field originally contained 17,282 acres of coal, and the yield has been an average of 5,130 tons to the acre. There is a steady trade in the coal sent to market from this district, notwithstanding the development of Virginia (Flat Top), West Virginia (North Potomac and New River, etc.), and the Pennsylvania districts which send coal to the same markets. Th connections with the tide-water markets are, (1) *via* the Baltimore and Ohio Railroad, from the town of Cumberland, 178 miles and Piedmont, 206 miles west from Baltimore. (2). The Chesapeake and Ohio Canal, from Cumberland to Georgetown, 184 miles, and Alexandria, 191 miles. The boats carry 110 tons, and make the trip in four or five days. The canal is owned by the State of Maryland, and is managed by a Board of Public Works. (3). The Pennsylvania State Line Branch, which taps the Cumberland and Pennsylvania Railroad near Mount Savage. (This gives an outlet to the Pennsylvania Railroad and its connections, for South Amboy, N.J.) (4). The George's Creek and Cumberland Railroad from the mines of the Maryland and American Coal Companies near Lonaconing to Cumberland (thence by canal), and to the Pennsylvania Railroad. The output began in the year 1842, and the total shipments to the end of 1886, are stated in the reports of the Cumberland coal trade to have been 52,377,045 gross tons, but from this should be taken the coal from the mines along the W. Va. Central Railroad in the North Potomac part of this basin, 1,986,272 gross tons.

Actual shipments of Maryland coal have been as below :

Year.	By B. & O. Railroad.	C. & O. C a n a l.	P. S. L. Railroad.	Total.
1882.....	807,320	269,782	185,335	1,262,537
1883.....	1,096,765	680,119	419,288	2,206,172
1884.....	1,767,000	344,954	356,097	2,469,051
1885.....	1,672,996	368,744	420,745	2,462,485
1886.....	1,630,020	282,802	239,891	2,152,713

Many companies have retired within a few years, their supply of "Big Vein" coal having run out. There are other, but smaller seams. The coal from these smaller veins will hardly come in use to any great extent, while that from the "Big Vein" continues to be mined at so low a rate as at present. The development in the North Potomac basin (where there is plenty of "Big Vein" yet to be worked), progresses very rapidly, and the output from the 14 foot seam there must continue to be a large one. This seam in Maryland is not with perfect accuracy called the 14 foot seam, its real thickness being from 8½ to 12 feet, and is often not worked to its full extent, the roof being insecure.

In 1886, there were 78,045 tons disposed of to the local trade, and 280,850 tons used by the B. and O. Railroad Company in its locomotives, rolling mills, etc. Prices have been as follows :

For George's Creek at New York—

1882.....	\$4 50	1885.....	\$3 25
1883.....	4 35	1886.....	3 10
1884.....	3 70		

## Cumberland at Baltimore—

1882.....	\$3 50	1885.....	\$2 25
1883.....	2 90	1886.....	2 10
1884.....	2 50		

Production has been as follows in the "Cumberland," basin :

Companies.	Tons, 1885.	Tons, 1886.
Consolidation.....	710,064	675,652
Maryland.....	365,319	288,742
George's Creek.....	257,343	265,942
American.....	220,339	211,305
Potomac.....	196,280	156,767
New Central.....	203,814	149,561
Borden.....	179,537	137,747
Maryland Union.....	98,095	116,771
Blæn Avon.....	69,192	65,830
National.....	48,307	62,637
Davis and Elkins.....	64,938	58,322
Swanton.....	58,002	42,688
Atlantic and George's Creek.....	52,862	7,321
Union.....	5,641	6,824
Piedmont.....	32	1,678
Elk Garden.....	269,883	211,379
Atlantic and George's Creek.....	.....	61,574
Big Vein.....	66,326	51,000
Davis.....	.....	20,677
Total.....	2,865,974	2,592,467

Wages in this region have been as below:—

1880—February advanced to 65 cents, [at which rate till March 15, 1882  
Then strike until August 24.

1882—August 24, 50 cents—Until November 15, 1884.

1884 November 16, 40 cents, at which it continued until

1886—March 8th, a demand for 50 cents, which was refused by the operators, and after six weeks' idleness, the men resumed at the former rate.

From State Line to Philadelphia is 298 miles ; to South Amboy, 365 miles.

We find the following analyses of Cumberland and Clearfield coals made by A. S. McCreath, and also of Cumberland coals with chemist not given.

	CLEARFIELD COALS.		CUMBERLAND COALS.		HAMPSHIRE CONSOLIDATION.	
	Kittaning.	Beaver Run.	Analyzed by McCreath.		Cumberland.	Cumberland.
Water.....	.670	.920	1.23	1.11	0.00	1.01
Vol. matter.....	21.360	21.550	15.47	15.30	12.30	13.92
Fixed carbon....	74.284	74.069	73.51	73.28	79.50	81.96
Sulphur.....	.435	.631	.70	1.23	.80	.....
Ash.....	3.251	2.890	9.09	9.08	7.40	3.11

Within the past year the Piedmont and Cumberland Railroad has been built to serve the North Potomac basin, and bring the coal to a connection with the Pennsylvania Railroad at Cumberland.

MICHIGAN.

The following table shows the production of coal in Michigan since 1877 ; the amount produced previous to 1877 is estimated to be 350,000 tons :

Years.	Tons.	Years.	Tons.
1877.....	69,197	1882.....	135,339
1878.....	77,715	1883.....	71,296
1879.....	82,015	1884.....	36,712
1880.....	130,053	1885.....	45,178
1881.....	130,130	1886.....	40,000

MISSOURI.

A line drawn from the junction of the Des Moines River with the Mississippi to the southwest corner of the State will have northwest of it nearly all the coal territory of Missouri. An arm of this territory, however, follows the course of the Missouri River east for a short distance, and coal is also found in the vicinity of Saint Louis. The total coal area of the State is about 23,100 miles. The Coal Measures are divided into three parts, as in Iowa—the Upper or Barren Measures, which are exposed over an extent of 8,406 square miles ; the Middle over an extent of 2,000 square miles, and the Lower, over an extent of 12,420 square miles. The aggregate thickness of the upper division is 137 feet, including about four feet of coal in two seams of 1 foot each and a few streaks ; the middle division is 324 feet thick, with 7 feet of coal, including two workable seams of 21 and 24 inches, and a third of 1 foot worked under favorable circumstances, besides six seams of extreme thickness ; the lower division is from 250 to 350 feet, embracing five workable beds varying from 1½ to 4½ feet in thickness, and thin seams between 6 and 11 inches, besides unimportant streaks, in all 13 feet 6 inches. The total thickness is therefore nearly 1,900 feet of Coal Measures and 26 feet 6 inches of coal. Good coal of workable thickness has been and is mined in the counties of Barton, Vernon, Cedar, St. Clair, Bates, Henry, Johnson, Pettis, Saline, Cooper, Lafayette, Ray, Carroll, Charitan, Howard, Boone, Callaway, Monroe, Randolph, Macon, Adair, Putnam, Schuyler and Sullivan. Around Rich Hill, Bates County, is a district that produces at least one-fourth of the coal mined in the State. New fields are being developed, new shafts put down and new and better machinery has taken the place of old and crude appliances.

The production has varied as below :

Years.	Tons.	Years.	Tons.
1882.....	2,000,000	1885.....	2,750,000
1883.....	2,250,000	1886.....	3,000,000
1884.....	2,500,000		

MONTANA.

Mr. Frederick F. Chisolm reports regarding the coal of this territory, that the most important and best developed field yet opened is the Bozeman, lying along the line of the Northern Pacific railway between Livingston and Bozeman. The veins here opened vary from three and one-half and four feet to seven feet in width, and dip from thirty degrees to ninety degrees, the average dip being about forty-five degrees. The general width of the field available for mining does not exceed 2,000 feet. The outcrop extends for eleven miles in length. The coal is generally clean and hard and black in color, with a brown-black streak. It breaks sometimes into good, square lumps, but in other portions of the vein the coal is friable. Some portions of the principal vein, the Bonanza, coke fairly well, but for manufacturing commercial coke the coal has to be washed. It has been demonstrated successfully that a coke can be made from it containing not more than 12 per cent. ash. There are eight seams in the field, of varying thickness, and very much broken up. Only two of these seams, Bonanza and Bozeman, are workable, because of the clay and colored sand, which it is impossible to separate from the coal.

The principal developments of the coal of the territory have been made by the Northern Pacific Coal Company, which supplies the fuel for the Northern Pacific railway. The Timberline mine, owned by the Northern Pacific Coal Company, varies from three and one-half to four feet in width. The coal makes steam well. Its composition is :

	Per Cent.	Per Cent.	Per Cent.
Water.....	3.0	7.0	2.19
Volatile matter.....	41.5	34.5	21.15
Fixed carbon.....	43.5	50.5	69.62
Ash.....	12.0	8.0	2.19

The product began in 1883 and has been up to January 1, 1887.

Years.	Tons.	Years.	Tons.
1883 .....	10,489	1885.....	83,156
1884.....	55,664	1886.....	46,846

Summary of Coal Production in Montana.

	1885.	1886.
Timberline.....	83,156	45,446
Bozeman.....	100	.....
Trail Creek.....	609	.....
Gardiner.....	500	.....
Sand Coulee.....	700	800
Belt Creek.....	1,200	600
Medicine Lodge.....	50	.....
Deer Lodge.....	100	.....
Total.....	86,415	46,846

The Livingston company are now burning and shipping an average of two and one-half cars of coke weekly. They will soon have more ovens in readiness for active operation. The coke thus far produced has been equal in quality to that shipped from Pennsylvania, and for smelting purposes is giving the best satisfaction. There may be enough "individual" coal produced to make the total last year 50,000 net tons.

### NEBRASKA.

The southwestern corner of Nebraska is covered by a portion of the Missouri coal field, the area being 3,600 square miles. The outcrops belong entirely to the upper of the three divisions of Iowa and Missouri, and the general opinion seems to be that no good workable beds of coal are likely to be found, at least near the surface. Beds of the thickness of 6, 11, 15 and 22 inches are reported from different counties. A seam of coal 30 inches in thickness was found in a drill-hole, at a depth of 820 feet from the surface, near Brownsville, Nemaha County. The report of coal being found at Omaha is very important, if true.

### NEW MEXICO.

The principal producers are the mines at Raton, through the Raton Coal and Coking Company, and those near San Antonio, through the San Pedro Coke Company. The output of the Raton mines in 1885 was 135,833 tons, and in 1886 only 87,706 tons. The greater proportion of this coal is used by the A., T. & S. F. as fuel. The small amount sold for commercial purposes goes to Raton, Las Vegas, and other towns on the line of the railway and in New Mexico. The coal does not coke. The mines at San Pedro produce an excellent coke, which is used generally by the New Mexico and Arizona smelters. The production of coal here in 1885 was 56,656 tons, and in 1886, 68,038 tons.

The output of coal has been :

	Tons, 1884.	Tons, 1885.	Tons, 1886.
Raton.....	102,513	135,833	87,706
Gallup.....	62,802	95,569	100,000
Monero.....	11,203	14,958	15,000
Cerillas.....	3,000	1,000	1,000
San Pedro.....	41,039	56,656	68,038

The San Pedro Company report 10,235 tons coke made and sold during 1886.

NORTH CAROLINA.

There is nothing of moment to record in regard to coal in this State, although some effort is reported of late as likely to be made to mine the coal locally known as the "Dan River" coal.

Analyses of the North Carolina coals, as given in a report by Dr. H. M. Chance, show :

		DAN RIVER COAL.
		Per Cent.
Water.....		1.79
Volatile matter.....		29.56
Fixed carbon.....		58.30
Ash.....		7.46
Sulphur.....		2.89
		100 00

OHIO.

The coal measures of Ohio are a part of the Appalachian coal field, the northwest prolongation of this great field underlying the eastern and southeastern part of the State. Speaking comparatively, over one-fourth of the State is underlaid with coal bearing strata, the area so occupied being estimated at from 10,000 to 12,000 square miles. Ohio, therefore, has the third place as to size of coal field among eight States included in the Appalachian system.

Below will be found analyses of coals of Ohio gathered from the report of the State Geological Survey.

	Moisture.	Volatile Matter.	Fixed Carbon.	Ash.
Brier Hill or Sharon coal.....	3.60	32.58	62.66	1.16
Massillon coal.....	6.95	32.38	57.29	3.18
Massillon coal.....	4.10	32.90	61.40	1.60
Brookville coal.....	7.00	30.80	59.50	2.70
Hocking Valley, average of 10.....	5.98	36.48	52.41	5.13
Hocking Valley, poorest.....	5.38	36.58	51.21	5.83
Hocking Valley, best.....	6.62	36.40	54.17	2.81
Salineville, big vein coal.....	2.32	39.08	52.78	5.82
Salineville, strip vein.....	1.70	34.30	59.50	4.50
Pittsburg, from Jefferson County.....	1.45	36.35	57.95	4.25
" " Belmont County.....	1.00	34.20	59.40	5.40
" " Athens County.....	2.70	35.30	55.05	6.95
" " Pomeroy County.....	4.10	33.90	56.10	5.90

The condition of the coal trade in Ohio has been by no means satisfactory : the discovery of natural gas in the vicinity of Pittsburg having an effect upon the coal trade of Ohio, as it crowded from the Pittsburgh market, 10,000 tons of coal per day, which has been obliged to seek new markets, and now comes in direct competition with Ohio coal on the lakes and elsewhere.

The coals of Ohio are all of the Bituminous variety, and are known by various and general names, as Block coal, gas coal, Cannel coal, etc., and by many special names, as Mahoning Valley coal, Hocking Valley coal, Salinesville coal.

etc., according to the localities from which they are drawn. The best furnace coal is the Block coal of the Mahoning Valley ; the best steam coal is the Hocking Valley ; the best coke is made from the coals at Leetonia, Washingtonville, in Columbia County ; the best house coal is found in Jackson County ; the best gas coal, so far as recent tests would seem to indicate, is the Barnesville coal of Belmont County.

The output in the State has been, according to the best figures obtainable, about as below :

Year.	Tons.	Year.	Tons.
1882.....	9,450,000	1885.....	9,000,000
1883.....	8,229,429	1886.....	9,500,000
1884.....	9,000,000		

#### PRODUCTION IN THE HOCKING VALLEY.

The C. & H. V. Railroad opened in 1877 ; the Ohio Central in 1880, and the Straitsville division of the Baltimore and Ohio in 1879. Last year the Columbus and Hocking Coal and Iron Company shipped 964,724 tons. This concern is the largest soft coal company of the United States. The business of the C. H. V. & T. road was 1,700,000 tons ; the B. & O., 510,000 tons, and the Ohio Central 750,000 tons in the past year, out of the Hocking Valley.

Year.	Tons.	Year.	Tons.
1882.....	1,812,833	1885.....	2,894,600
1883.....	1,916,355	1886.....	2,960,000
1884.....	2,725,000		

#### OUTPUT OF THE MAHONING VALLEY.

Year.	Tons.	Year.	Tons.
1882.....	1,000,000	1885.....	1,000,000
1883.....	1,200,000	1886.....	1,200,000
1884.....	925,000		

#### OREGON.

The coal mines in Oregon are mainly located on Coos Bay, in the western portion of the State, about one hundred miles north of California boundary, and forty miles north of Cape Blanco. The Coos Bay coal-field covers several hundred square miles of territory, stretching from the Umpqua River on the north to points beyond the Coquille River on the south, and extending back from the coast from fifteen to twenty miles. The country is covered with a heavy growth of timber. The field can be worked profitably only where the coal is of good quality, favorably situated for cheap mining, and very close to navigable waters.

The vein worked at the Southport mine, on Coos Bay, is from four feet six inches to five feet thick.

The following analyses are given :

	COOS BAY.	ASTORIA.
	Per Cent.	Per Cent.
Water.....	20.00	2.56
Volatile matter.....	32.59	46.29
Fixed carbon.....	41.98	48.49
Ash.....	5.94	2.74
	99.91	100.06

The output at present is not large, and the principal market is San Francisco, Cal., and we find that the receipts there of Coos Bay and Newport coal have been in the neighborhood of forty thousand tons a year. In 1883 the receipts were 24,525 tons, in 1884 they amounted to 25,217 tons, in 1885 to a total of 27,699 tons, and in 1886 to 42,168 tons.

PENNSYLVANIA—ANTHRACITE.

Of comparatively insignificant extent, the Anthracite coal basins are without doubt the most important, commercially speaking, in the country. The chief fields are four in number, and are contained in most part in the counties of Lackawanna, Luzerne, Carbon, Schuylkill, Columbia, Northumberland and Dauphin. Sullivan County contains a detached deposit, known as the Loyalsock field, which produces a coal similar to that found in the Lykens Valley district, except in the color of its ash, which is white. The chief fields, with their respective areas are reported by the State Geological Survey, to be as follows :

Field.	Sq. Miles.
Northern field .....	200
Eastern middle field.....	40
Western middle field.....	90
Southern field.....	140
Loyalsock field.....	.....
Total.....	470

In trade circles the Schuylkill region includes the Western middle coal field and that portion of the southern coal field west of Tamaqua. The Lehigh region includes the eastern middle coal field and that portion of the southern coal field east of Tamaqua, known as the Panther Creek Basin. The Wyoming region includes the Wyoming and Lackawanna Basins, which together form the Northern coal field.

PRODUCTION.—A number of statistical tables have been prepared by different authorities to show the past production of the Anthracite region. Of these the tables compiled by Prof. P. W. Sheaffer for the years 1820 to 1868 in-

clusive, and since 1868 by Mr. John H. Jones, accountant of the Anthracite transporting companies, have been adopted as the most correct. This table does not include the coal sold to the local trade and consumed for fuel at the collieries. This amount in the past has been variously estimated to be from 8 to 10 per cent. of the total tonnage reported as shipped to market. At the present time it would seem to range from 5 to 6½ per cent. in the different parts of the Anthracite region. Although the amount of coal burned within the region has increased from year to year, the percentage of the total amount mined which has been so used has unquestionably diminished at the same time.

Production of Anthracite Coal.

The business of theseveral districts was as below in the years named, as reported by Mr. J. H. Jones, the official accountant.

Years.	Schuylkill.	Lehigh.	Wyoming.	Total.
1882.....	9,459,288	5,689,437	13,971,371	29,120,096
1883.....	10,074,726	6,113,809	15,604,492	31,793,027
1884.....	9,478,314	5,562,266	15,677,753	30,718,293
1885.....	9,488,426	5,898,634	16,226,470	31,623,529
1886.....	9,381,407	5,723,129	17,031,826	32,136,362

Division of Shipments, 1884-1886.

Interest.	Tons, 1884.	Tons, 1885.	Tons, 1886.
Philadelphia and Reading Railroad.....	11,163,920	11,680,780	11,690,483
Lehigh Valley Railroad Company.....	5,935,254	6,107,444	6,184,456
Delaware, Lackawanna and Western Railroad.....	5,204,362	4,987,834	5,172,022
Delaware and Hudson Canal Company.....	3,362,680	3,301,873	3,480,687
Pennsylvania Railroad Company.....	3,169,287	3,393,685	3,478,885
Pennsylvania Coal Company.....	1,397,946	1,500,885	1,398,179
New York, Lake Erie and Western Railroad.....	484,844	651,226	731,649
Totals.....	30,718,293	31,623,529	32,136,362

The Pennsylvania Railroad interest includes Shamokin coal, Lykens Valley coal, and some Wyoming coal. Reading is of the various grades of Schuylkill. Lehigh Valley is three-fourths Lehigh and balance Wyoming. Central Railroad of New Jersey is about equally divided between Lehigh and Wyoming. Delaware and Hudson ; Delaware, Lackawanna and Western Company ; Pennsylvania Coal Company, all from Wyoming region. "Erie" coal is from Wyoming.

Output by Districts.

Output of the several districts, by percentages, has been.

Years.	Schuylkill.	Lehigh.	Wyoming.
1882.....	32.48	19.54	47.98
1883.....	31.69	19.23	49.08
1884.....	30.85	18.11	51.04
1885.....	30.01	18.65	51.34
1886.....	29.19	17.81	53.00

Tonnage to Tidewater.

In regard to the tonnage to tide or Eastern competitive points, we have the following facts :

1882.....	12,018,764 out of a total of 29,120,096
1883.....	13,148,185     "     "     31,793,027
1884.....	12,009,855     "     "     30,718,293
1885.....	11,956,587     "     "     31,623,529
1886.....	12,042,480     "     "     32,136,362

The growth of the interior and Western trade can be gathered from the comparison made above.

Monthly Production of Anthracite.

The fluctuating production of Anthracite month by month is shown in the following schedules :

	Tons, 1882.	Tons, 1883.	Tons, 1884.	Tons, 1885.	Tons, 1886.
January.....	1,833,910	2,075,742	1,899,572	1,641,803	2,338,271
February.....	1,605,243	1,937,997	1,892,687	1,767,707	2,385,028
March.....	2,108,042	2,375,512	1,881,463	2,025,790	2,759,391
April.....	2,135,802	2,511,710	2,828,209	2,326,223	2,194,726
May.....	2,256,097	2,439,224	2,628,142	2,439,765	2,253,639
June.....	2,625,039	2,670,582	2,029,179	2,490,032	2,592,318
July.....	2,757,248	2,615,686	2,602,615	2,801,006	2,433,348
August.....	2,894,702	3,324,711	3,552,410	3,023,910	2,682,001
September.....	2,558,443	3,084,355	2,677,890	3,259,183	2,896,472
October.....	2,945,037	3,426,273	3,063,434	3,562,166	3,512,177
November.....	2,797,372	3,198,094	3,031,954	3,279,116	3,277,636
December.....	2,599,439	2,133,247	2,630,736	2,996,825	2,811,350
Totals.....	29,120,096	31,793,027	30,718,293	31,623,529	32,136,362

PHILADELPHIA & READING R. R. CO.

Total Tonnage Carried—Fiscal Years November 30.

Year.	Tons.	Year.	Tons.
1882.....	8,429,829	1885.....	12,530,593
1883.....	13,939,439	1886.....	13,124,163
1884.....	11,879,997		

(From June 1, 1883, C. R. R. tonnage is included.)

Details of the Distribution of Tonnage for 1886.

Passing over Main Line and Lebanon Valley Branch.....	4,782,842
For shipment by Schuylkill Canal.....	67,865
Shipped westward via Cat. and Wpt. Branch and N. C. Railroad.....	64,417
Shipped west via Sunbury, Shamokin and Lewisburg.....	424,227
Shipped east via Lehigh Valley Railroad.....	125,011
Shipped west and south from Pine Grove.....	162,150
Consumed on laterals.....	117,737
Shipped over L. & S. Division of Central Railroad of New Jersey.....	4,704,722
Bituminous coal carried.....	968,954
Coal for company's use.....	958,053
Anthracite from connecting lines.....	248,051

*Production of C. & I. Co. of the Leased Properties and Average Cost at Mines.*

Year.	C. & I. Co.	Leased Lands.	Cost.
1882.....	4,111,830	1,512,954	\$1.47
1883.....	4,582,667	1,491,465	1.49
1884.....	4,925,387	746,697	1.48
1885.....	5,236,528	803,650	1.43
1886.....	5,616,363	592,839	1.53

## THE LEHIGH VALLEY R. R. CO.

*Total Coal Tonnage—Fiscal Years November 30.*

Year.	Tons.	Year.	Tons.
1882.....	6,257,159	1885.....	6,258,178
1883.....	6,527,912	1886.....	6,656,474
1884.....	6,008,999		

## Tonnage received from—

	1884.	1885.	1886.
Wyoming region.....	1,440,925	1,585,294	1,932,372
Hazleton region.....	2,385,415	2,430,889	2,392,614
Beaver Meadow region.....	724,436	750,897	805,692
Mahanoy region.....	1,458,222	1,491,098	1,525,794

## Distribution of tonnage :

	1884.	1885.	1886.
To New Jersey Division.....	1,807,166	1,997,677	1,870,973
Pennsylvania and New York Railroad.....	821,244	927,813	1,177,991
Bel. Del. Division of Pennsylvania Railroad.....	1,467,036	1,463,923	1,391,724
Line trade and connections.....	1,913,555	1,865,765	2,275,786

## THE DELAWARE, LACKAWANNA &amp; WESTERN R. R. CO.

Year.	Tons.	Year.	Tons.
1882.....	4,595,518	1885.....	4,992,865
1883.....	5,011,407	1886.....	5,144,986
1884.....	5,184,563		

## Details as to destination are :

	1884.	1885.	1886.
Shipped north.....	2,229,300	2,409,497	2,393,226
Shipped south.....	2,955,262	2,583,868	2,746,759

This includes coal carried, purchased and mined. Northern, is that tonnage to New York State and westward, and Southern is the tide coal, and that along the line between mines and tide.

DELAWARE & HUDSON CANAL CO.

Year.	Tons.	Year.	Tons.
1882.....	3,297,826	1885.....	3,315,693
1883.....	3,512,973	1886.....	3,499,723
1884.....	3,362,680		

Adding the quantity carried for other parties over its railroads, this company transported 4,137,680 tons in 1886.

Distribution has been as below :

	1884.	1885.	1886.
Shipped south.....	70,902	260,691	210,589
To Oswego.....	35,166	21,228	.....
West via Erie.....	502,868	473,034	453,895
North via A. & S.....	952,779	1,024,208	1,146,049
To Honesdale, for canal.....	1,800,965	1,536,519	1,689,195

PENNSYLVANIA COAL CO.

Coal Production and Shipment.

Year.	Tons.	Year.	Tons.
1882.....	1,438,820	1885.....	1,500,685
1883.....	1,431,682	1886.....	1,476,054
1884.....	1,304,974		

The distribution of this was :

	1884.	1885.	1886.
West by Erie.....	223,411	285,590	332,417
East by Erie.....	1,080,547	1,215,095	1,143,637

LEHIGH & WILKESBARRE COAL CO.

Year.	Tons.	Year.	Tons.
1882.....	2,162,240	1885.....	2,212,022
1883.....	2,265,042	1886.....	2,435,552
1884.....	2,070,264		

LOYALSOCK COAL PRODUCTION.

Year.	Tons.	Year.	Tons.
1882.....	75,947	1885.....	81,450
1883.....	84,576	1886.....	69,562
1884.....	88,018		

## PENNSYLVANIA &amp; NEW YORK R. R. CO.

*Total Tonnage—Fiscal Years November 30.*

## ANTHRACITE COAL.

Year.	Tons.	Year.	Tons.
1882.....	1,076,966	1885.....	1,440,761
1883.....	1,262,784	1886.....	1,699,336
1884.....	1,351,408		

## BITUMINOUS COAL.

Year.	Tons.	Year.	Tons.
1882.....	371,005	1885.....	231,002
1883.....	333,565	1886.....	177,524
1884.....	302,100		

## PENNSYLVANIA R. R.—BELVIDERE DIVISION.

Received From.	1884.	1885.	1886.
Lehigh region.....	1,570,659	1,529,210	1,517,230
Mahanoy region.....	263,515	271,964	271,480

Distributed To.	1884.	1885.	1886.
Trenton for shipment.....	121,969	111,581	76,445
South Amboy for shipment.....	682,058	571,244	514,523
Local consumption.....	842,869	895,284	952,945
Company use.....	187,233	223,065	244,786

## NEW YORK, LAKE ERIE &amp; WESTERN RAILWAY.

The production of Anthracite by collieries controlled by this Company has been as below :

Year.	Tons.	Year.	Tons.
1882.....	330,510	1885.....	651,226
1883.....	382,194	1886.....	731,649
1884.....	523,546		

The total coal carried in the last fiscal year of this Company is said to have been : Anthracite, 6,579,681 tons ; Bituminous, 1,325,466 tons ; coke, 103,011 tons.

The coal companies owned by the New York, Lake Erie & Western Railroad Company have mined during the year the following tonnage :

	Company Supply.	For Market.	Total.
Hillside Coal and Iron Company—Anthracite.....	145,117	408,919	554,036
Northwest Mining and Exchange Company—Bituminous and coke....	236,023	241,352	477,375
Blossburg Coal Company—Bituminous and coke.....	229,887	176,964	406,851
Towanda Coal Company—Bituminous.....	146,893	12,955	159,848
Total coal and coke.....	757,920	840,190	1,598,110

The N. Y., P. & O. carried 318,590 tons Anthracite, 1,186,101 tons Bituminous, and 556,607 tons coke in its last fiscal year.

LEHIGH COAL AND NAVIGATION COMPANY.

Year.	Tons.	Year.	Tons.
1882.....	777,286	1885.....	1,127,291
1883.....	913,916	1886.....	1,041,798
1884.....	958,844		

This company dates back to 1820 as a mining and carrying company. The figures in schedule above are the figures of the production at the "Summit" mines.

SIZES OF ANTHRACITE.

The following figures give the maximum range in the sizes of mesh used for separating the coal into different sizes :

Lump coal passes over bars placed  $4\frac{1}{2}$  to 9 inches apart.

Steamboat coal passes over bars  $3\frac{1}{2}$  to 5 inches apart, and through bars placed about 7 inches apart.

Broken coal passes over a mesh  $2\frac{3}{8}$  to  $2\frac{7}{8}$  inches, and through a mesh (or bars)  $3\frac{1}{4}$  to  $4\frac{1}{2}$  inches.

Egg coal passes over a mesh  $1\frac{3}{4}$  to  $2\frac{1}{4}$  inches, and through a mesh  $2\frac{3}{8}$  to  $2\frac{7}{8}$  inches.

Large stove coal passes over a mesh  $1\frac{1}{4}$  to  $1\frac{7}{8}$  inches, and through a mesh  $1\frac{3}{4}$  to  $2\frac{1}{4}$  inches.

Small stove coal passes over a mesh 1 to  $1\frac{1}{4}$  inches, and through a mesh  $1\frac{1}{4}$  to  $1\frac{1}{2}$  inches.

Chestnut coal passes over a mesh  $\frac{5}{8}$  to  $\frac{3}{4}$  inch, and through a mesh 1 to  $1\frac{1}{4}$  inches.

Pea coal passes over a mesh  $\frac{3}{8}$  to  $\frac{5}{8}$  inch, and through a mesh  $\frac{5}{8}$  to  $\frac{7}{8}$  inch.

Buckwheat coal passes over a mesh 3-16 to  $\frac{3}{8}$  inch, and through a mesh  $\frac{3}{8}$  to  $\frac{5}{8}$  inch.

Dirt passes through a mesh 3-16 to  $\frac{3}{8}$  inch.

## ANTHRACITE ENTERED INTO CONSUMPTION.

So far as can be gathered this is made up as below :

	1884.	1885.	1886.
Stock January 1.....	748,330	874,681	754,545
Production.....	30,756,995	31,623,529	32,136,362
Total supply.....	31,505,325	32,498,210	32,890,907
Stock December 31.....	874,681	754,545	372,282
Consumption.....	30,630,644	31,743,665	32,518,625

All gross tons of 2,240 pounds.

## PRICES OF ANTHRACITE.

*Prices of Anthracite at New York City in 1882, 1883, 1884, 1885 and 1886.*

Grades.	Lump.	Grate.	Egg.	Stove.	Nut.
1882.					
Free-burning (lowest).....	\$3.90	\$3.90	\$3.90	\$4.00	\$3.90
Free-burning (highest).....	4.30	4.30	4.55	4.85	4.75
Hard white-ash (lowest).....	4.85	4.25	4.25	4.25	3.90
Hard white-ash (highest).....	5.15	4.50	4.70	4.90	4.70
1883.					
Free-burning (lowest).....	3.90	3.90	4.00	4.20	4.20
Free-burning (highest).....	4.30	4.30	4.55	4.85	4.75
Hard white-ash (lowest).....	4.85	4.10	4.10	4.35	4.10
Hard white-ash (highest).....	5.15	4.50	4.70	4.90	4.70
1884.					
Free-burning (lowest).....	3.80	3.80	3.80	4.15	4.00
Free-burning (highest).....	3.80	3.80	3.80	4.40	4.15
Hard white-ash (lowest).....	4.75	4.10	4.10	4.15	4.00
Hard white-ash (highest).....	4.75	4.10	4.10	4.40	4.15
1885.					
Free-burning (lowest).....	3.30	3.00	3.00	3.50	3.10
Free-burning (highest).....	3.45	3.25	3.40	4.10	3.60
Hard white-ash (lowest).....	4.25	3.35	3.25	4.00	3.40
Hard white-ash (highest).....	4.75	3.50	3.40	4.25	3.75
1886.					
Free-burning (lowest).....	3.25	2.80	2.85	3.00	3.00
Free-burning (highest).....	3.45	3.55	3.80	4.15	3.85
Hard white-ash (lowest).....	4.25	3.35	3.35	3.65	3.00
Hard white-ash (highest).....	4.25	3.75	4.00	4.15	3.65

## SCHUYLKILL LUMP COAL AT PHILADELPHIA.

Average prices per 2,240 lbs. during the years named :

1877.....	\$2.59	1882.....	\$4.75
1878.....	3.25	1883.....	4.50
1879.....	2.70	1884.....	4.50
1880.....	4.53	1885.....	4.50
1881.....	4.50	1886.....	4.00

## LEHIGH LUMP AT ELIZABETHPORT, N. J.

Average prices per 2,240 lbs. during the years named :

1877.....	\$3.60	1882.....	\$5.25
1878.....	3.50	1883.....	5.00
1879.....	3.29	1884.....	5.00
1880.....	4.63	1885.....	4.50
1881.....	5.10	1886.....	4.25

PERCENTAGES OF SIZES OF ANTHRACITE.

The Philadelphia and Reading Coal and Iron Company report as follows for the fiscal years ending November 30th :

Sizes Made.	Year 1883.	Year 1884.	Year 1885.	Year 1886.
	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>
Lump.....	4.7	3.5	2.6	3.0
Steamboat.....	9.6	9.1	8.2	9.0
Broken.....	14.7	13.8	13.7	15.4
Egg.....	15.5	14.7	15.0	15.5
Large Stove.....	19.0	18.1	17.3	22.0
Small Stove.....	5.1	6.8	7.4	.....
Chestnut.....	11.6	12.3	13.2	12.2
Pea.....	14.8	16.7	17.1	16.6
Buckwheat.....	5.0	5.0	5.5	6.3
	100	100	100	100

DISTRIBUTION OF ANTHRACITE.

The following statement, showing the general distribution of entire production of Anthracite coal in 1885, is of value :

To Pennsylvania, New York and New Jersey.....	21,132,179
To the New England States.....	5,172,964
To the Western United States.....	3,029,385
To the Southern States, including Delaware, Maryland and the District of Columbia.....	1,362,500
To the Pacific Coast.....	10,700
To the Dominion of Canada.....	878,177
To foreign ports.....	37,624
Total, gross tons.....	31,623,529

ANALYSES OF ANTHRACITE COALS.

Prepared by Charles A. Ashburner, geologist, of the Geological Survey of Pennsylvania :

No. of Spec.	Name of Coal Bed.	Name of Coal Field.	Water.	Volatile Matter.	Fixed Carbon.	Sul-phur.	Ash.	Total.	Specific Gravity.
3	Wharton....	East. mid.....	3.713	3.080	86.404	.585	6.218	100	1.620
5	Mammoth....	East. mid.....	4.119	3.084	86.379	.496	5.922	100	1.617
2	Primrose....	West. mid.....	3.541	3.716	81.590	.499	10.654	100	1.654
5	Mammoth....	West. mid.....	3.163	3.717	81.143	.899	11.078	100	1.657
2	Primrose?....	(F) Southern...	3.008	4.125	87.982	.506	4.379	100	1.584
2	Buck M'nt....	West. mid.....	3.042	3.949	82.662	.462	9.885	100	1.667
1	Seven-foot....	West. mid.....	3.410	3.978	80.868	.512	11.232	100	1.651
7	Mammoth....	Southern.....	3.087	4.275	83.813	.641	8.184	100	1.631
3	Mammoth....	Northern.....	3.421	3.381	83.268	.727	8.203	100	1.575

PERCENTAGES OF ANTHRACITE PRODUCTION.

The percentages of the business actually done by the several companies has been as below :

	1884.	1885.	1886.
Philadelphia and Reading R. R. Co.....	36.30	36.94	36.36
Lehigh Valley R. R. Co.....	19.30	19.31	19.25
Delaware, Lackawanna and Western R. R. Co.....	16.92	15.77	16.10
Delaware and Hudson Canal Co.....	10.93	10.44	10.82
Pennsylvania Railroad Co.....	10.30	10.73	10.82
Pennsylvania Coal Co.....	4.55	4.75	4.35
New York, Lake Erie and Western R. R. Co.....	1.70	2.06	2.30
Total.....	100.00	100.00	100.00

TOTAL PRODUCTION OF ANTHRACITE COAL SINCE 1820.

We have given on other pages the shipments out of the various regions, with the note that there should be added some eight per cent. for local and colliery use. In the report of the State Geological Survey are some figures showing that recently it is just over seven per cent. according to the returns furnished by the mine inspectors. We annex the summary, with the addition of the shipments for the year 1886.

Total shipment 1820 to 1882 (Sheafer & Jones).....		438,580,394
Estimated local and colliery consumption 1820 to 1882.....		39,472,235
Production reported by mine inspectors, 1882.....		31,281,066
"    "    "    "    1883.....		33,955,831
"    "    "    "    1884.....		32,641,499
"    "    "    "    1885.....		34,836,960
Total production 1820 to 1885.....		609,767,985
Shipments for 1886 (Jones).....	32,136,362	
Add seven per cent.....	2,249,545	34,385,907
Grand total.....		644,153,892

PENNSYLVANIA.—(Bituminous.)

The details given below are intended to present in a practical form the progress of the industry. It must be borne in mind that, as yet, the gathering of statistics on this important product is not as complete as it should be. From the returns which are available, and official figures already in hand that may be relied upon, there is sufficient to show that the total put down as the tonnage of Bituminous coal produced in this State is none too large. There are many items, such as local supply to mills, coal for railroad use and about collieries, and many small works whose output never gets into the reported totals.

By returns furnished the Bureau of Industrial Statistics of Pennsylvania it appears that Bituminous coal is produced in twenty-five counties, in quantities ranging from a few thousand tons per annum to several millions of tons. The county of Clearfield, in the central part of the State, shows the largest output, aside from those counties in the southwestern corner—Allegheny, Fayette and Westmoreland.

From the best sources of information, the following statement of the production of Bituminous coal in Pennsylvania has been prepared:

Year.	Tons.	Year.	Tons.
1881.....	20,000,000	1884.....	25,000,000
1882.....	22,000,000	1885.....	25,000,000
1883.....	24,000,000	1886.....	27,000,000

Details of the localities and the output of many of them are given in the succeeding pages.

Production of the Pennsylvania Bituminous coal mines in 1884 and 1885, as reported by the Bureau of Statistics :

Counties.	Tons, 1884.	Tons, 1885.
Ailegheny.....	2,863,631	3,588,244
Armstrong.....	170,826	139,327
Beaver.....	156,095	184,631
Bedford.....	69,770	107,694
Blair.....	208,541	205,075
Bradford.....	313,575	249,920
Butler.....	151,335	85,429
Cambria.....	659,843	1,037,000
Cameron.....	13,552	7,706
Centre.....	216,422	373,504
Clarion.....	329,973	299,216
Clearfield.....	2,177,543	3,368,671
Elk.....	413,243	537,826
Fayette.....	4,041,643	3,192,972
Huntingdon.....	212,527	247,424
Indiana.....	30,758	82,750
Jefferson.....	450,079	479,675
Lawrence.....	42,818	42,137
McKean.....	78,870	44,132
Mercer.....	276,350	378,508
Somerset.....	269,930	302,715
Tioga.....	931,922	1,067,031
Venango.....	15,000	7,000
Washington.....	707,262	836,633
Westmoreland.....	3,282,735	3,774,072
Total.....	18,084,941	20,639,472

# NORTH PENNSYLVANIA DISTRICT.

In what is known as the North Pennsylvania Region, is found the coal sold in market as " Blossburg " and " Barclay " coals. The first coal went out in 1840, and to the first of January, 1886. the total production was set down at 18,488,686 net tons.

Production during 1886 was by the following, in net tons.

Blossburg Coal Company.....	455,584
Morris Run Coal Mining Company.....	479,366
Fall Brook Coal Company.....	453,661
Towanda Coal Company.....	143,383
Long Valley Coal Company.....	61,000

The Blossburg trade, including the three companies first named above was:

Year.	Tons.	Year.	Tons.
1882.....	1,165,604	1885.....	1,074,581
1883.....	1,217,870	1886.....	1,388,611
1884.....	1,018,342		

The Blossburg Company made and sold 51,812 tons coke last year.

The McIntyre mines opened in 1870, were closed down in 1884, after a total output of 2,417,320, details of which have appeared in previous editions.

The Fall Creek Coal Co., in the years 1865-1875, shipped 524,516 tons.

The Barclay Coal Co., in 1856-1867, mined and shipped 412,640 tons.

The Schreader Coal Co., in 1874-1884, mined and shipped 1,696,042 tons.

The Towanda Coal Co. has been at work since 1865, and in the past five years the tonnage has been :

Year.	Tons.	Year.	Tons.
1882.....	210,917	1885.....	246,397
1883.....	226,806	1886.....	143,383
1884.....	181,786		

### CLEARFIELD REGION.

Below will be found a few analyses of Clearfield coal, from the reports of the Pennsylvania Geological Survey, Andrew S. McCreath, Chemist:

No.	Water.	Volatile matter.	Fixed carbon.	Sulphur.	Ash.	Colliery,
1.....	.81	20.640	74.023	.507	4.02	Penn.
2.....	.67	21.360	74.284	.435	3.251	Franklin.
3.....	.78	21.680	73.052	.688	3.80	Eureka.
4.....	.71	23.400	72.218	.532	3.14	Sterling.
5.....	.76	20.090	74.779	.666	3.70	Moshannon.
6.....	1.10	23.070	71.199	.611	4.02	New Moshannon.
7.....	1.10	22.450	72.300	.....	4.15	New Moshannon.
8.....	.74	25.210	68.928	2.122	3.30	Hales.
9.....	.70	23.565	68.89	1.715	5.13	Mapleton.
10.....	.62	22.135	68.728	.867	7.65	Logan.
11.....	.80	23.260	72.35	.590	3.00	Laurel Run.
12.....	.55	24.09	71.689	.571	3.10	Morrisdale.
13.....	.56	25.19	71.013	.587	2.65	Morrisdale.
14.....	1.63	22.00	72.815	.425	3.13	Webster.
15.....	.92	21.55	74.009	.631	2.83	Beaver Run.
16.....		18.30	78.60	.40	2.60	Webster.

The total of Clearfield County is over four million tons; for there is the coal at DuBois, that at Karthaus, 150,000 tons; the coal over the Tyrone and Clearfield road, 2,273,147 tons; the coal over the Beech Creek, 1,050,000 tons; the coal over the Bells Gap branch. In addition there is a large local consumption for fire brick-kilns, machine shops, etc., etc. All this immense annual tonnage has grown into being in a very short period of time, mainly in ten years.

We are informed that of the total shipments of coal over the Tyrone road, some seventy per cent. thereof reaches tide at Baltimore, Philadelphia and South Amboy. Average distance from collieries in this region, via. the T. & C. road, to Philadelphia, 255 miles; to South Amboy, 322 miles; to Baltimore, 227 miles. The Beech Creek is the shortest route to New York harbor by forty miles, while great advantages for connections north, east and west are given by its connections with the Pine Creek R. R. and the N. Y. C. R. R. The very extensive mines of the Clearfield Bituminous Co., furnish a large portion of the tonnage of this road, but some coal was carried over this line for R. H. Chipman and R. B. Wigton & Sons. It is stated upon the best authority that nearly every regular line of steamships entering New York now burns Clearfield coal.

### Tyrone and Clearfield Tonnage.

Year.	Tons.	Year.	Tons.
1882.....	2,838,970	1885.....	2,901,613
1883.....	2,857,710	1886.....	2,273,147
1884.....	3,173,363		

*Beech Creek Railroad Tonnage.*

Year.	Tons.	Year.	Tons.
1882.....	234,751	1885.....	774,055
1883.....		1886.....	1,050,238
1884.....			

The Irvona Coal Co. is operating coal mines and making coke, at Coalport, in Clearfield County. Its coke shows by analysis : 88.994 fixed carbon ; 0.670 volatile matter; 10.173 ash, and 0.163 per cent. of water.

## THE MONONGAHELA REGION.

Year.	Tons.	Year.	Tons.
1882.....	4,057,384	1885.....	3,298,200
1883.....	4,339,492	1886.....	4,123,945
1884.....	3,170,900		

By means of its slack-water navigation, the Monongahela River is made navigable at all seasons of the year, and boats carrying 800 tons are passed down. The larger portion of the coal shipped by river is run down the Ohio and Mississippi to the lower markets of Cincinnati, Louisville, New Orleans, etc. It will be noticed that there is a very large increase in the tonnage last year, in spite of all the drawbacks to trade, low prices, etc. The railways are penetrating new and old coalfields in this part of Pennsylvania, and carrying off some of the trade formerly done by water, and the States which lay to the south of the Monongahela are sending coal into the ports and places which have heretofore been solely supplied by coal from Pittsburgh. Prices of coal have been very low in the lower River markets supplied by the shippers from along the Monongahela ; the price at Louisville and Cincinnati ranging from 5 to 7 cents per bushel, at wholesale. The average mining rate was 2½ cents per bushel and the average value of the coal, say 5 cents a bushel at point of sale and delivery. An effort is being made to have the U. S. Government buy the rights and privileges of the Monongahela Navigation Co., and make this river a free highway, such as the Kanawha River now is by reason of its slack-water navigation.

## BROAD TOP SEMI-BITUMINOUS COAL FIELD.

An outlet for the coal from the region is afforded by the Huntingdon and Broad Top Mountain Railroad (this was completed in 1856, and during the latter part of that year 42,000 tons were forwarded from this region to various markets). The line extends from the town of Huntingdon, on the Pennsylvania Railroad, 203 miles west of Philadelphia, to Mt. Dallas, in Bedford County, a distance of 45 miles. At Saxton, 24 miles from Huntingdon, a branch road, 10 miles in length, extends to Broad Top City ; at Riddlesburg, 5 miles beyond Saxton, is a branch into Fulton, 5 miles from the main road. From Mt. Dallas the Bedford and Bridgeport Railroad, 386-10 miles in length,

extends to the Maryland State line; from this point to Cumberland, Indiana, via the Cumberland and Pennsylvania Railroad is 7 miles. At or near Cumberland connection is made with the Cumberland and Pennsylvania and the George's Creek and Cumberland roads. This district is increasing its output, as the statistics for the past year will show, and this year is expected to show still further growth. The coal is semi-bituminous in its nature, and has been largely used for blacksmithing purposes, for generating steam in locomotives, marine and stationary engines, in rolling mills, puddling furnaces, and forge fires; with glass works it is a special favorite. It gives a white ash, is free burning, and easily ignited. Included in this region are all the mines in Huntingdon and Bedford Counties.

Statistics are given below :—

*Tonnage of Broad Top coal carried by the H. and B. T. Mtn. R. R.:—*

Year.	Tons.	Year.	Tons.
1882.....	271,216	1885.....	176,075
1883.....	196,534	1886.....	385,796
1884.....	192,706		

*Tonnage of Cumberland coal carried :—*

Year.	Tons.	Year.	Tons.
1882.....	208,031	1885.....	460,289
1883.....	471,785	1886.....	239,891
1884.....	394,114		

*Deliveries to the Pa. R. R. by the East Broad Top Railroad Co. at Mt. Union, have been :—*

Year.	Tons.	Year.	Tons.
1882.....	99,095	1885.....	51,878
1883.....	44,737	1886.....	51,050
1884.....	43,514		

There were 62,730 tons additional used at the furnaces along the line during 1886.

#### WESTMORELAND REGION.

Year.	Tons.	Year.	Tons.
1882.....	1,278,121	1885.....	1,293,813
1883.....	1,399,702	1886.....	1,305,732
1884.....	1,320,186		

In Westmoreland County, Pa., is located an extensive area of Bituminous coal of the best quality. In fact, its reputation has been earned for many years, as the typical coal for gas-making purposes. It is used in almost every

seaboard city, and the interior trade is also large ; all other coals are sold as near the price of this article as the best efforts of the seller can achieve. The celebrated Penn and Westmoreland gas coals are mined near Penn and Irwin stations, on the line of the Pennsylvania Railroad, while Scott & Co.'s Ocean mines are on the Baltimore and Ohio road. It will thus be seen that two trunk lines are subservient to the interest of the gas-coal trade, and the eastern market can be reached from Baltimore, Philadelphia and South Amboy. Considerable development of steam coal and coking coal has been made in this county, and the tonnage is yearly increasing. Above shipments from this district are those reported by the Pennsylvania Railroad.

On the border of Indiana County, adjoining the county of Westmoreland, is the extensive operation of the Saltsburg Coal Company. The seam of coal worked is that known in the market as the Westmoreland gas coal. It shows by analysis : 31.48 volatile matter ; 61.50 fixed carbon ; 6.04 ash ; 1.17 sulphur. When this coal is distilled at a heat which will produce 4.6 feet of gas from each pound of coal, each ton of coal produces 10,304 cubic feet of gas, five cubic feet of which, burned in a standard argand burner, give a light equal to that produced by 18.49 standard candles.

#### SNOW SHOE REGION.

Year.	Tons.	Year.	Tons.
1882.....	233,708	1885.....	148,500
1883.....	257,230	1886.....	113,967
1884.....	183,271		

This region is located in Centre County, Pa. It covers an area of about eight miles in length and some four miles in breadth, and is situated on both sides of Beech Creek. The coal finds an outlet to market *via* the Bellefonte and Snow Shoe and Bald Eagle Valley connections of the Pennsylvania Railroad. The distance from Snow Shoe to Tyrone (on the main line) is forty-seven miles. The colliery at Snow Shoe, and the railway, were opened up in 1862, and were operated by the Bellefonte and Snow Shoe Railroad Company until January, 1881, when the Pennsylvania Railroad Company secured the mines and railroad, by purchase, and a company was organized to mine coal and make coke, which, during 1885, sold out to the Lehigh Valley Coal Company, which is now the operator of this coal-field. The "Cato" coal is to be developed this year, and good results are looked for.

#### ALLEGHENY MOUNTAIN REGION.

We include in this district all the collieries located near to or upon the Pennsylvania Railroad and branches in Blair and Cambria Counties, producing something like a million and a half tons per annum. Many large consumers of coal, such as the Cambria Iron Works, are located in this district. There were carried to market by the Pennsylvania Railroad 672,564 tons coal and 201,868 tons coke last year. The Sonman vein coal is well known and much liked. An

analysis of this coal shows : Volatile matter, 18.30; fixed carbon, 78.60; ash, 2.70; sulphur, 0.40. Martin & Co.'s Trout Run mines produce a coal which shows by analysis, as made by A. S. McCreath : Fixed carbon, 77.132; volatile matter, 18.535; moisture, 0.840; sulphur, 0.573; ash, 2.920; coke, 80.625; color of ash, cream. The Gallitzin Coal and Coke Company is also operating in this coal-field. The shipment of coke from this district is likely to be more extended this year, for new ovens are being built. The Gallitzin coke shows : 90.687 fixed carbon, 0.790 volatile matter, 0.108 water, 0.927 sulphur, and 7.488 ash, as per report of A. S. McCreath.

### REYNOLDSVILLE REGION.

Geographically, the Reynoldsville coal basin is located in the southwest portion of Jefferson County, Pa. Its range is northeast and southeast; its northeastern boundary being in the vicinity of Falls Creek, on the Low Grade Railroad, and its southwestern boundary about one and one-half miles west of Punxsutawney. The basin contains what are known as the Freeport and Kittanning Bituminous coal measures. The first, or upper, are the upper and lower Freeport beds, each being from five to seven feet in thickness. The second, or lower, are the Kittanning upper and lower beds, each being from three and one-half to four feet in thickness. The quality of the coal is excellent both for gas and steam purposes and the manufacture of coke, as the steady increase in production from year to year fully attests. For steam purposes it is equalled by none in the market, unless it may be the George's Creek or Salisbury coals. As a gas coal it is very good, but not quite up to the high standard of the celebrated Youghiogheny, but it is capable of producing an average of 9,500 cubic feet of gas to the ton, and its illuminating value is about fifteen-candle power. It makes an excellent quality of coke of fine lustre and high percentage of fixed carbon, and is equal to any for blast furnaces and foundry purposes.

#### Analyses of coals from Jefferson County, Pa. :

Fixed carbon.....	63.617	65.835	61.285	63.081	63.544	62.524	69.916
Volatile matter.....	30.220	27.705	33.430	33.260	31.170	30.800	30.933
Water.....	1.300	1.150	1.570	1.000	1.100	1.100	.983
Sulphur.....	.763	.930	1.055	1.139	1.016	.776	1.063
Ash.....	4.100	4.380	2.660	1.520	3.170	4.800	6.105

An analysis of coke shows : 88.869 fixed carbon ; vol. matter, .552 ; sulphur, 1.012 ; ash, 9.333.

The railway facilities for the distribution of this valuable fuel to the markets of the northwest and Canadian provinces are first-class ; the Buffalo, Rochester and Pittsburgh road offers the most direct avenue to Buffalo and Rochester and the various connections thence ; the Allegheny Valley low grade, the B. N. Y. & P. and the Bradford extension also afford connections with the markets of Pennsylvania and New York State. All the coal from Beech Tree, Walston mines, the Jefferson Coal Company, Powers, Brown & Co., and Reynoldsville, and from Du Bois, in the northwestern portion of Clearfield County, is sold under the general name of "Reynoldsville," and reaches market via the B. R. & P. formerly the Rochester & Pittsburgh Railroad. The largest producers in the district are Bell, Lewis and Yates, Powers, Brown & Co., and the

Rochester & Pittsburgh Coal and Iron Company. It is safe to put the output of this district at about a million tons for last year. The B. R. & P. road holds the key to the trade in soft coal that finds a market via Buffalo and Rochester, and will keep it, so long as the coal traffic is in the hands of its present factors.

All the coal—Bell, Lewis & Yates of Du Bois, and Powers, Brown & Co. of Reynoldsville—goes on the Buffalo, Rochester, and Pittsburgh road northward. The Allegheny Valley road does not carry any of the coal of this district; the coal for tide or points along the “Erie” is given to that road at Johnsonburg. The Allegheny Valley coal trade comes from the mines at Fairmont and New Bethlehem; there is one small concern at Tylers. The Reynoldsville district is one of the wonders of the country; in fact, it is claimed that there is nothing like it in the State or nation—good coal and plenty of it.

#### MERCER COUNTY.

There is a development going on in Mercer and Butler Counties which bids fair to put them on the record as large coal producers within a very short period of time. In the year 1885 there was a tonnage of 463,937 tons, and this was very largely increased in the past year. The extension of the Shenango and Allegheny railroad, from Shenango, on the P. & E., to Butler, on the West Pennsylvania, has wakened up this whole county. There are thirty mines opened, and with a fair year for coal this district will make itself heard in Buffalo, and the lake and Canadian markets. Coal is of good quality, ranges from 4 to 4½ feet in thickness, is easily mined, and reached by shaft. Some coke is made from this coal, and there is a market for all that is produced, at fair prices. This coal is one of the most popular coals reaching the Buffalo market.

#### SOMERSET COUNTY.

There is a good quality of coal mined in this district, and as it is claimed to be an extension of the same seam as that found along George's Creek, it is often sent to market as “Cumberland” coal. An analysis made by the chemist of the Geological Survey shows: 1.655 water, 22.350 volatile matter, 68.774 fixed carbon, 1.246 sulphur; ash, 5.965. Coke per cent., 75.985. Color of ash, gray, with pink tinge. The tonnage was said to foot 281,257 tons in 1883, say 269,930 tons in 1884, and 302,715 tons in 1885.

#### ELK COUNTY.

An important coal mining company, known as the Northwestern Mining and Exchange Company, is located in Elk County. It is an auxiliary of the Erie Railway Company, and the coal produced is largely used by that company. During 1886 they produced 494,453 tons of coal, and made and sold 4,897 tons of coke. The following is an analysis of the coal seam: Water, 1.47; volatile matter, 34.24; fixed carbon, 58.45; sulphur, 1.49; ash, 4.35.

#### McKEAN COUNTY.

Year.	Tons.	Year.	Tons.
1882.....	73,834	1885.....	44,132
1883.....	84,899	1886.....	35,000
1884.....	78,870		

## THE COAL TRADE.

In this county there is a large deposit of prime Bituminous coal, and only one point from which coal is mined and marketed at present. In the eastern portion of the basin, the Buffalo Coal Company is at work. It is on the McKean and Buffalo Railroad, an extension from the Buffalo, New York and Philadelphia Railroad, and this gives an outlet for the coal of this section to Buffalo and Rochester. There is better coal found in districts more advantageously located, and this accounts for the falling off in tonnage.

We give the following analysis of three samples, from the Pennsylvania Geological Survey Report of 1875 :

Water.....	1.130	1.300	1.170
Volatile matter.....	33.090	39.830	35.440
Fixed carbon.....	53.606	52.063	43.992
Sulphur.....	1.874	1.727	1.708
Ash.....	10.900	5.080	17.690

### PENNSYLVANIA RAILROAD COAL TONNAGE.

Districts Received From.	TONS, 1885.		TONS, 1886.	
	Coal.	Coke.	Coal.	Coke.
Snow Shoe.....	148,500	25,643	113,967	29,036
Karlsruhe.....	120,969	.....	154,086	.....
Tyrone and Clearfield.....	2,873,876	.....	2,273,147	24
Gallitzin and Mountain.....	550,244	193,091	672,564	201,868
West Pennsylvania.....	219,750	64,901	318,493	110,168
Southwest Pennsylvania.....	102,689	1,999,923	158,185	2,715,895
Westmoreland Region.....	1,293,813	252,397	1,305,733	339,965
Mononwahela Region.....	267,502	108,706	414,611	152,061
Pittsburgh Region.....	236,703	.....	278,671	628
North and West Branch.....	1,294,334	.....	1,388,340	.....
Sunbury, Hazleton and Wilkes-Barre.....	321,192	.....	359,384	.....
Other Points.....	.....	.....	9,451	.....
ORIGINATING OFF THE P. R. R.—				
Anthracite.....	3,087,531	.....	2,965,124	.....
Semi-Bituminous.....	1,062,193	57,652	1,327,740	70,466
Grand Total, net tons.....	11,579,596	2,702,313	11,739,495	3,620,111

### COKE IN PENNSYLVANIA.

The counties producing coke, and their tonnage in net tons of 2,000 lbs., is stated in the report of the Bureau of Statistics to have been, as below, during the calendar year 1885.

Counties.	Tons.	Counties.	Tons.
Alleghany.....	19,416	Clearfield.....	49,552
Armstrong.....	10,311	Elk.....	3,438
Beaver.....	438	Fayette.....	2,074,734
Bradford.....	41,632	Huntingdon.....	62,838
Bedford.....	91,459	Jefferson.....	90,053
Butler.....	5,015	Somerset.....	5,382
Cambria.....	100,606	Tioga.....	16,100
Centre.....	6,127	Washington.....	900
Clarion.....	7,057	Westmoreland.....	1,001,768

This gives a total of 3,588,876 net tons, and the footings for 1886, will no doubt show a business at least 25 per cent. greater. We may expect a larger

tonnage during 1887 from some of the districts outside of the great Connellsville district, such as the Clearfield (Wigton and Sons, and the Irvona Coal Co.) district, and in the Cambria (Piper & Co. and the Gallitzin C. & C. Co.), as also the Jefferson (Rochester & Pittsburgh C. & I. Co.). The Bradford and Tioga, is also doing more, while Huntingdon and Bedford will increase, as the iron trade improves. Fayette and Westmoreland, however, still hold the palm, as they contain the Connellsville coking coal belt.

#### CONNELLSVILLE COKE.

This is the typical coke of the country, and all other coke makers endeavor to bring their product up to the standard of this fuel.

Descriptions of this field, its extent, location, etc., have been given in preceding editions. We need, therefore, merely recapitulate some of the salient points.

By analysis, made by McCreath, of Frick's coal, it is stated to be composed of 59.62 fixed carbon ; 30.11 volatile matter ; 8.23 ash ; 0.78 sulphur ; 1.26 moisture. The coke made by the same company is stated to contain 89.57 fixed carbon ; 0.30 moisture ; 9.11 ash ; 0.82 sulphur.

Connellsville coal, from which the coke is made, is very soft and is easily mined, one miner being able to dig and load an average of about seven wagon loads, of 33½ bushels daily. The coal is hauled from the mines by mules, in trains of about four wagons each. The coal is dumped from the wagons into an iron larry of a capacity of about 100 bushels. This larry is a square iron wagon that runs on railroad rails directly over the ovens and the coal is dropped from the larry into the oven through an opening at the top of oven. An average charge of 7,600 pounds of coal is put into each oven, and after burning 72 hours, 4,800 pounds of coke are taken out. After the sulphur and gases contained in the coal have passed off and the coal has been thoroughly coked, pure water is introduced into the oven, by means of a long iron pipe, and the fire extinguished. The coke is then drawn out of the ovens with long iron hooks, and loaded directly into the railroad cars. The heat retained in the wall of the ovens after the coke has been drawn, is sufficient to ignite the succeeding charge. All Connellsville coke is sold by the net ton (2,000 pounds). Weighs 40 pounds to the bushel. Measures 50 bushels to the ton. Measures 2,688 cubic inches to the bushel. Measures 134,400 cubic inches to the ton. Measures 77 13-17 cubic feet to the ton.

#### PRICES OF CONNELLSVILLE COKE.

In 1883, before the syndicate was formed :—January 1 to 19, \$1.35 ; January 26, \$1.25 ; February 2, \$1.20 ; February 9 to 23, \$1.15 ; March 2 to May 11, \$1.05 ; May 18 to June 1, 95c. ; June 8 to August 17, 90c. ; August 24 to December 28, \$1.00.

1884—January 1 to April 1, 90 to 95c. ; from April 1 to January 1, 1885, \$1.10.

1885—January 1 to April 1, \$1.10 ; from April 1 to January 1, 1886, \$1.20.

1886—January to April, \$1.20 ; April, \$1.35 ; May 1 to December 31, \$1.50.

1887—January and February, \$2.00.

Above quotations for furnace coke, at the ovens, per 2,000 lbs.

The division of coke shipments out of the Connellsville district at present is : Pennsylvania Railroad, 48 per cent. ; Lake Erie, 27 per cent. ; Baltimore & Ohio, 25 per cent. It is claimed that these percentages are not always adhered to.

During the year 1885, the syndicate shipped 133,082 cars, aggregating 2,144,861 tons of coke, out of the Connellsville district. In the year 1886, there were 216,611 cars, aggregating 3,521,919 tons of coke, so shipped. The coke made by independent operators would come to about 30,000 tons a month in addition to the above.

### TENNESSEE.

Professor Henry E. Colton says :—The Tennessee coal field has been divided geologically into three divisions, the lower, or sub-carboniferous, the Middle (the lower of the Pennsylvania classification), and the Upper Measures. The area of the several divisions has not been distinctly defined. The Lower Measure coals are of considerable importance on the northwest side of the Tennessee coal field. Above them is the great conglomerate, which forms the floor of the vast area of irregular country called the Cumberland plateau. In a series of irregular ridges resting on this plateau are found a part of the Middle Measure. Above this series occurs another conglomerate, frequently, however, but a sandstone. The Upper Measure coals come in above and exist in a series of irregular and high mountains—in the counties of Scott, Morgan, Anderson, and Campbell. From the northwest side of this coal field there is a slight but steady depression of the strata to the southeast, and on the southeast this gradual depression has culminated in a great downthrow, with outlying ridges, the position of the strata in which is sharply the reverse of that of the northeast and southwest depression. The chief seam of coal in this State is the Sewanee seam, which furnishes a greater amount of coal than any other single seam in Tennessee, and has all the qualities that combine to make a useful and valuable coal. It varies in some of its characteristics and constituents in different localities, but in general, is a good steam making coal, makes a hot durable fire in grate, and is nearly free from sulphur ; it also makes a good coke. It is the only seam in the Lower Measures (adopting the more accurate classification), which is of value in the Southern part of the State, and is mined extensively in the vicinity of Tracy City, in Grundy County, and at many other points about the headwaters of the same stream, as well as at other places in the southern portion of the field.

The mines operated by the Tennessee Coal, Iron, and Railroad Company are the largest single mining operation in the State. The mines are located at Tracy City, on a broad gauge branch road, which connects with the Nashville and Chattanooga Railroad at Cowan, and their product in 1886 was 120,262 tons coal, and they sold in addition some 137,468 tons coke=274,936 tons coal.

The output of coal in Tennessee showed an increase as the railway facilities are extended, and the manufacturing enterprises increase in number. One of the most recent developments is the product of coal from a seam in the Jellico Mountain, from which it has been distinctively named. The Jellico

Mountain is a spur from the Great Cumberland water divide, which shoots off to the north at the point where the divide changes its usual northeast and southwest course to the east. To within the past four years it was both inaccessible and unexplored. The completion of a railroad line from Knoxville to Louisville has rendered it accessible and has led to some developments. The product of this region is already great, and yet other mines are about to be opened. That this development has been hastened by the liberal rates of the railroads, especially of the Louisville and Nashville management, there is no doubt,

The output of coal in Tennessee has been :

Years.	Tons.	Years.	Tons.
1882.....	850,000	1885.....	1,440,957
1883.....	1,000,000	1886.....	1,700,000
1884.....	1,200,000		

We give analyses of coals of this State :

	Fixed Carbon.	Volatile.	Ash.	Sulphur.	Water.
Coal Creek, Anderson Co.'s Mine.....	57.52	33.82	3.09	.20	1.04
Coal Creek, Empire Mine.....	57.69	37.80	2.55	.....	.....
Sewanee, Tenn., Coal and R. R. Co.....	63.50	29.90	6.60	trace.	.....
Sewanee, Tenn., Coal and R. R. Co.....	63.00	29.30	6.60	trace.	.....
Etna, Kelly Seam.....	74.20	21.39	2.70	.70	1.30
Emery Mines, Walden's Ridge.....	63.10	27.70	7.70	.53	1.50
Sharp's, beyond Careyville.....	64.32	31.15	2.31	.....	2.22
Sewanee Coke.....	83.36	.....	15.44	.14	1.06
Crudup.....	59.70	29.06	9.04	1.08	1.12

TEXAS.

The coal fields of Texas are coming quite prominently to the front of late years. There are three very large fields in the State—the Red River, the Rio Grande, and the Pecos district. In the first of these districts are embraced the Counties of Montague, Clay, Wise, Jack, Young, Shackelford, Palo, Pinto, Parker, Erath, Comanche, Eastland, Callahan, Brown, Coleman, Runnels, McCulloch, San Saba and Menard. The same coal also crops out at various places in Burnet, Mason, Llano, and Tom Green counties, and they may therefore be considered a part of the same district. As this State has never yet had a geological survey, the extent of her coal strata is not well defined. It is supposed, however, to embrace about 30,000 square miles in the northern and western portions of the State. Over this great area coal has been found at many places, but at no place has it been mined except to a small extent. It is a Bituminous coal, and almost, if not quite, precisely similar to the McAlister coal of the Indian Territory. Extensive developments of superior coal have been made at and near Laredo. This point is on the line of the Rio Grande and Pecos Railway. On this railway, near Laredo, and on the coal lands belonging to the company, several mines have been opened, in two of which

on the railroad company's land, known as the Hunt mines; the thickness of coal seams found is from 18 to 26 inches. Three workable veins of coal are believed to exist on the property, tests having indicated their presence. This State probably produced 125,000 tons of coal during 1885, and possibly a slight increase in 1886.

### UTAH.

The earliest coal developments made in Utah were at Coalville, Summit County, where in 1864 operations were commenced at what is now the Home Mine of the Home Coal Company. The vein here is twelve feet thick, being opened at two places. About 100 men are employed, and the product is consumed chiefly at Park City in operating silver mines and mills. Many other mines are located near Coalville on the Weber River.

The Pleasant Valley coal is also a well-known coal, and is probably the best coal mined in Utah. The mines are two in number, are owned by the Denver and Rio Grande Railway, and are located at Schofield, about one hundred and fifteen miles southeast of Salt Lake City.

Another less known, but old mine, is the San Pete Valley mine, in San Pete County, nearly one hundred miles south of Salt Lake City. This mine has been opened in a small way nearly twenty years, and is worked only to supply a local demand. The vein is 5 feet thick, and affords a hard, Bituminous coal.

South of Pleasant Valley a few miles, is Castle valley, where, as well as in Ione County, farther south, very large deposits of coal have been discovered. The remoteness of these from transportation will, however, long delay their development. Of the coal at Castle Valley, it is reported one vein is clearly 25 feet thick. There are three more seams which will average four to five feet thick, and a first-class cannel vein about five feet thick; also, a vein of lignite 16 feet thick, connected with the cannel vein, making a vein of cannel and lignite that will average 20 feet in thickness. These seams are the lowest coal veins in Utah Territory, running under the Pleasant Valley and the Fairview coal veins to a great depth. They have been extensively developed, having been constantly worked for over three years.

The Home Coal Company, at their Coalville mines, supply enough coal to the mines and mills in its vicinity. In 1886, the company mined 23,373 tons during the 250 working days, making an average of 80 tons per day. This coal, although being a good article for making steam, gives from 40 to 50 per cent. slack. The Grass Creek mines, near Coalville, turned out 31,300 tons of coal last year.

Following are some analyses of Utah coals:

Coal.	Water.	Vol. Matter.	Fixed Carbon.	Ash.
Home .....	10.32	33.90	46.37	4.30
Pleasant Valley .....	4.80	39.75	49.95	5.50
San Pete .....	2.05	31.07	49.85	17.02
Grass Creek .....	8.97	39.10	48.60	3.32

The output was some 200,000 gross tons. The commercial business in the years named was said to have been as below :

Company.	Tons, 1885.	Tons, 1886.
By Pleasant Valley Coal Co.....	80,253	72,500
Utah Central Co.....	41,397	34,400
By Grass Creek Mines.....	52,125	31,300
By Home Coal Co.....	22,259	23,373
Small mines.....	1,560	7,009
Total Net Tons.....	197,594	168,573

Several small mines are being opened this year. The Crested Butte coal is being sent into the Territory to a considerable extent.

### VIRGINIA.

The old time accounts of coal in Virginia dealt entirely with the Richmond coal basin, and it is only sufficient for the present purpose to state that the output in that district is now but a limited one, from the fact that coals of a better quality can be had more readily. During the past few months there has been a disposition to further develop this district and put the coal on the market. In the counties of Montgomery, Pulaski and Wythe is what is called the Blacksburg coal field. All this coal contains a large amount of ash, and has now been superseded by the opening of the semi-Bituminous coal mines at Pocahontas, in Tazewell County, and reached by the New River branch of the Norfolk and Western Railroad.

The coal is known in market as "Pocahontas-Flat Top." The bulk of the product of these mines is carried to Lamberts Point, near Norfolk, where the company has built one of the finest coal shipping piers in the country. In order to reach this rich deposit of coal the railroad company built the New River branch, leaving the main line at Centre, 43 miles west of Roanoke, and running along the New river 75 miles to Pocahontas, thus giving a haul of 376 miles to tidewater.

The remarkable growth of this, the latest competitor for the steam coal trade of the Atlantic coast, warrants a few figures being given. In June, 1883, the first shipments were made, and the output each year has been :

Year.	Tons.	Year.	Tons.
1883.....	105,805	1885.....	651,987
1884.....	272,173	1886.....	924,361

All tons of 2,000 lbs.

It is expected that the total for the current year will be fully one and a half million tons, for it must be remembered that new connections are constantly being made with railroads, new iron furnaces are to be built in districts contiguous to the line of the Norfolk & Western ; these must be supplied with coke made from this coal. The great steam coal district of Pennsylvania—the Clear-

field—commenced shipping in 1863, and it was not until 1875 that a tonnage of 933,297 tons was reached.

The pioneer operator of this great coal field was the Southwest Virginia Improvement Company. They have three large openings into the coal, and have made the best record for loading coal of any mine in the United States, if not in the world. In a test of ten hours work they dumped and loaded in gondolas 3,547 tons.

The development of this famous district—for its coal has become known all over the world—is due entirely to the shrewdness of certain Philadelphia capitalists. The sale of the coal shipped at tidewater (from Norfolk) is in charge of Messrs. Castner & Curran, and they have ably pushed it.

The operators in this district are as named: Southwest Virginia Improvement Company at Pocahontas, Va.; John Cooper & Co. and the Mill Creek Coal and Coke Co. at Coopers, Mercer Co., W. Va.; the Caswell Creek Coal and Coke Co., William Booth & Co., Stephenson, Mullin & Co., the Mercer Coal and Coke Co., and Moore, Deaton Bros. & Co. at Bramwell, Mercer Co., W. Va. In addition to the above, five operations were arranged for during the latter part of the year, namely: S. A. Crozer, on Elkhorn River, W. Va., and the Shamokin Coal and Coke Co., the Elkhorn Coal and Coke Co., Goodwill & Douty, and Marshall & Goodwill, at Bramwell; all of whom will be shipping coal during the current year.

The average analysis of ten samples of coal taken by Prof. A. S. McCreath, from various points in this field show: Water, .694; Volatile Matter, 18.832; Fixed Carbon, 74.066; Sulphur, .761; Ash, 5.647.

The coke industry in this field is becoming a very prominent feature. The Southwest Virginia Improvement Company had in operation during the year 1886 two hundred ovens. There are now under construction, and to be completed during the present year, in addition to above by Stephenson, Mullin & Co., sixty-six; Mill Creek Coal and Coke Co., one hundred; William Booth & Co., twenty-five; Freeman & Jones, forty; Mercer Coal and Coke Co., eighty; Goodwill & Douty, one hundred; Marshall & Goodwill, one hundred; Elkhorn Coal and Coke Co., one hundred; Shamokin Coal and Coke Co., one hundred; and Samuel A. Crozer, one hundred.

As an exhibit of the production of coal in Virginia the following is appended:

Year.	Tons.	Year.	Tons.
1879.....	61,803	1883.....	225,000
1880.....	100,000	1884.....	300,000
1881.....	100,000	1885.....	650,000
1882.....	100,000	1886.....	1,000,000

Analysis of the Virginia so-called Anthracites is given below:

	Pulaski Co. Altoona Mine.	Wythe Co. Little Walker.
Carbon.....	49,353	55,615
Volatile Matter.....	9,459	16,264
Water.....	0,236	0,466
Ash.....	33,830	26,630
Sulphur.....	1,112	0,995
	100,000	100,000

In a paper recently read before the American Institute of Mining Engineers, entitled "Comparison of some Southern Cokes and Iron Ores," by Prof. Andrew S. McCreath and E. V. d'Invilliers, the average analyses of coke from the Birmingham, Chattanooga, Pocahontas and Connellsville districts are thus compared.

	Birmingham.	Chattanooga.	Pocahontas.	Connellsville.
Water.....	.157	.447	.347	.060
Volatile Matter.....	.803	1.101	.757	.428
Fixed Carbon.....	87.299	80.513	92.550	88.962
Sulphur.....	1.195	1.595	.597	.810
Ash.....	10.545	16.344	5.749	9.740

### WASHINGTON TERRITORY.

There has been a great increase in the tonnage raised in this Territory, and the importance of coal to the several industries on the Pacific warrants the conviction that there will be a valuable continuance of this rapid development. The deposits of coal in this Territory are mainly in the vicinity of Seattle and at Bellingham Bay. That of Seattle is the most important, covering, as it does, a very large area. The coals of the Bellingham Bay, New Castle and Renton and Chehalis Valley are lignites. Those of the Green River field are Bituminous lignites, and those of the Shagit and Wilkeson fields are Bituminous.

The Bellingham Bay mine was the first to ship coal, beginning in 1860, and continuing until 1878, when, owing to the destruction of the mine by fire, all business stopped. The shipments were greatest in 1876, when 21,280 tons were received at San Francisco. The total receipts were 215,904 gross tons. An analysis of this coal shows :

Component Parts.	Per Cent.
Water.....	8.39
Volatile matter.....	33.26
Fixed carbon.....	45.69
Ash.....	12.66
Total.....	100.00

The Bellingham Bay mine put out, say, 250,000 tons during its period of activity, of which 233,043 tons were shipped to market.

The Carbon Hill mines, located some thirty-two and one-half miles from Tacoma, near to the line of the Northern Pacific Railroad, are the second largest coal producers in Washington. Coal is loaded at Tacoma, and there is a growing trade with San Francisco, as the following will show.

Year.	Tons.	Year.	Tons.
1881.....	18,356	1884.....	136,896
1882.....	54,120	1885.....	157,241
1883.....	137,420	1886.....	144,579

Back of Seattle, is the New Castle Lignite Field. It is a good coal, and comes out in fine blocks, and gives about two-thirds the heat of Bituminous coals. The Renton mine is 13 miles east of Seattle. An analysis of this coal shows :

	Per Cent.
Water .....	11.69
Volatile matter .....	35.90
Fixed carbon .....	45.97
Ash.....	6.44
	100.00

We append a statement showing the shipments of coal at and from Seattle to San Francisco and other coast ports.

Year.	Tons.	Year.	Tons.
1881.....	147,418	1884.....	189,222
1882.....	154,611	1885.....	193,175
1883.....	164,986	1886.....	200,000

From the data at hand the total output in the territory to January 1, 1885 is put at about 2,200,000 tons.

*Output of Coal in Washington Territory.*

Name of Coal Mines.	1884.	1885.	1886.
Carbon Hill.....	125,759	128,063	144,226
South Prairie.....	29,469	40,161	54,441
Tacoma.....	2,432	5,603	585
Cedar Mountain.....	1,546	29,802	17,406
Black Diamond.....		49,360	65,700
Renton.....	32,709	85,587	16,731
New Castle.....	188,782	122,092	79,059
Gross tons.....	380,698	410,667	378,147

## WEST VIRGINIA.

The principal districts in which the Bituminous coals are mined in this State, are on the B. & O. Railroad west from Preston County, where gas coal of a superior quality is mined ; on the Ohio River : on the Great Kanawha and New Rivers, and at Elk Garden, on the Upper Potomac River, and any recapitulation of the output should include all these districts.

There has been quite an increase in the output in the past year, for the demand is growing for the coals of the Kanawha and New Rivers, in all the markets both east and west. The constantly increasing output of semi-Bituminous coal from the New River portion of the Great Kanawha field, is shown in the fact that the Chesapeake and Ohio Railway conveyed to market in 1886, 619,586 net tons of this noted coal ; also 185,254 net tons of coke equal in value for all metallurgical purposes to any coke made in the United States. This New River

coal field is a belt of country upon the eastern side of the Great Appalachian coal basin, that is some eighteen miles where it is crossed at right angles to its general course, by New River and the Chesapeake and Ohio Railway. It is the region of the Lower, or No. XII. coal measures, which in Pennsylvania are unproductive, having seams of coal only a few inches thick, but which here contain three workable beds. The Quinnimont, the Fire Creek and the Nuttall, in ascending order—of superior coking and steam semi-Bituminous coals that are remarkable for their high percentages of carbon and their low percentages of ash, sulphur and phosphorous compared with any of the other coals of this country.

The Chesapeake and Ohio Railway follows the New River, cutting off some of its longer bends, through this coal field for about thirty-four miles from its 365th mile post west from Newport News at Glade, where it is 1,237 feet above tide, to its 399th mile post from Newport News at Hawks Nest, where it is 828 feet above tide. The comparative statement of shipments, given below, shows the shipments via the Chesapeake and Ohio Railway in a term of years :

	Cannel.	Gas.	Steam.	Splint.	Total Tons.
1881.....	25,183	229,564	263,517	177,786	696,050
1882.....	30,910	345,705	357,744	124,422	858,981
1883.....	21,013	373,371	405,602	103,327	903,313
1884.....	23,056	324,473	323,063	154,203	884,795
1885.....	32,770	334,036	600,515	203,077	1,170,398
1886.....	17,406	348,940	619,586	248,917	1,234,849

The coke transported has been:

Year.	Tons.	Year.	Tons.
1881.....	77,376	1884.....	81,515
1882.....	91,919	1885.....	126,391
1883.....	100,786	1886.....	185,254

All these returns are in net tons of 2,000 pounds.

*Analyses of the Coal and Coke of this region.*

Of the Coals.	Cannel.	Gas Coal.	Peerless.	Quinnimont.	Nuttallburg.	Cabin Creek.
Fixed Carbon.....	23.50	56.65	55.42	75.89	70.67	57.17
Volatile matter.....	58.00	35.75	39.82	18.19	25.35	38.92
Moisture.....	....	1.08	....	0.94	1.35	0.93
Ash.....	18.50	5.20	2.54	4.98	2.10	2.98
Sulphur.....	....	1.32	....	....	0.53	....

Of the Cokes.	Sewell.	Nuttallburg.	Quinnimont.	Quinnimont.
Fixed Carbon.....	93.00	91.22	93.85	91.72
Ash.....	6.73	7.53	5.85	5.09
Sulphur.....	0.27	0.92	0.30	0.48

The shipments out of the Kanawha district by water are reported by Major

W. P. Craighill, in charge of the improvements on the river, to have been as below :

Year.	Tons.	Year.	Tons.
1882-1883.....	1,146,428	1884-1885.....	1,231,295
1883-1884.....	1,219,210	1885-1886.....	1,272,612

That quality of coal known in the New York and Eastern markets as "West Virginia Gas Coal" is mined in Taylor, Harrison, and Preston Counties, West Virginia, the mines being located near to or upon the main line of the Baltimore and Ohio Railway. The coal is used for gas making in the cities of the seaboard, and is very favorably spoken of. Analyses of these coals have given the following results :—

	Vol. matter.	Fixed carbon.	Ash.
Clarksburg, main seam.....	56.74	41.66	1.60
Clarksburg Cannel.....	49.21	45.43	5.36

There was an output of about 300,000 tons last year ; this is mined by the Despard, Newburg Orrel, Tyrconnel, Fairmont, Consolidated, Monongahela and Gaston Coal Companies. Prices were very low last year, and this district suffered in consequence. The Newburg Orrel Co. is shipping steam coal and making coke.

	Tons.
For use of C. & O. Railway Company.....	267,145
On line of road west of Richmond.....	199,411
At Huntingdon, for shipment on Ohio River.....	20,391
To connecting railroads.....	328,800
At James River wharves, for shipment.....	601,948
At Newport News, for shipment.....	1,417,695
Total coal carried.....	

The West Virginia Central and Pittsburgh Railway is vigorously developing the great coal basin of the north branch of the Potomac that it now traverses for an air-line distance of nearly 36 miles from Piedmont, on the Potomac and the Baltimore and Ohio Railroad to Davis, the present terminus of its line on the Blackwell fork of Cheat River, south of the noted "Fairfax Stone," corner of Maryland and West Virginia. The "Big Vein" steam and smithing coal is mined at four collieries on this road, the Elk Garden, the Armstrong, the Atlantic and George's Creek, and the Davis. In addition to the eastern or tide-water trade, this coal goes to Cincinnati, Chicago, St. Louis, St. Paul, Omaha, and other western cities, and cargoes of this coal were sent *via* Baltimore to San Francisco.

In the Elk Garden district, on the Upper Potomac, the development has been as stated below :—

Year.	Tons.	Year.	Tons.
1880.....	66,573	1884.....	466,923
1881.....	88,722	1885.....	403,459
1882.....	277,929	1886.....	344,730
1883.....	333,001		

The above are in gross tons of 2240 pounds.

The largest individual concern on the Kanawha is the Winifrede Coal Co. They ship altogether by water, and the tonnage last year was 167,054 tons ; they claim that they are debarred from rail shipments by reason of the high freight maintained on that route, to the eastern markets.

Production last year may be set down at 4,000,000 tons, derived as below :

	Tons.
From Elk Garden.....	344,730
From Kanawha, per C. & O.....	1,440,000
From Kanawha by water.....	1,200,000
From mine of B. & O. Road.....	500,000
From other sources.....	500,000

The mine inspector gives a total of 3,213,093 gross tons of coal, plus the coal for 228,623 tons coke, as the production during 1886—partly estimated. The mines in Mercer County are put down for 292,557 gross tons.

Comparatively, this year shows with others as below :

Year.	Tons.	Year.	Tons.
1882.....	2,000,000	1885.....	3,483,457
1883.....	2,085,565	1886.....	4,000,000
1884.....	3,000,000		

### WYOMING.

The coal-fields of Wyoming are of great extent and value. They have been known since 1850, but remained undeveloped until the completion of the Union Pacific Railroad to Carbon, 100 miles west of Laramie, in 1868. In quality the coal is a lignite of superior grade, and suitable for all heating and domestic purposes, but non-coking and useless for gas making.

The mines are owned or operated by companies in the interest of the Union Pacific and Central Pacific Railroad Companies. The mines at Carbon were opened in 1868, and had produced from that time up to the beginning of 1885 some 1,668,640 net tons. The following analyses from the coal produced are of interest :

	Carbon No. 1.	Carbon No. 2.	Rock Springs.	Almy.
	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>
Water.....	8.10	6.10	7.00	15.40
Volatile matter.....	34.70	33.80	36.81	33.90
Fixed Carbon.....	51.65	49.30	54.46	44.78
Ash.....	5.55	5.80	1.73	5.92
	100.00	100.00	100.00	100.00

The mines at Rock Springs produce an excellent quality of Bituminous lignite.

The Rock Spring mines were opened up in the year 1868, and the total output up to the beginning of 1885 was some 2,375,253 net tons. The coal is said to stand exposure to the atmosphere without slacking to an unusual degree for coals of this character.

At Almy are mines owned by the Union Pacific and the Central Pacific companies. The former company began in 1869, and the latter in 1872 (when it was known as the Rocky Mountain Coal Company). The coal is not so good as that at Rock Springs.

The total output of the Union Pacific mines at Almy, to the beginning of 1885, was 980,209 net tons, and of the Central Pacific mines some 1,195,966 net tons.

At Twin Creek some coal was mined by the Union Pacific Company, which has controlled the mines since 1881, and the output has been 90,695 tons in the three years to 1885, and for that year it is reported that some 17,207 net tons were mined, and the mines then abandoned.

The coal fields of Northern Wyoming are just beginning to attract attention. The construction of the Chicago and Northern into this section of the territory during the year of 1886, has naturally led to the development of coal prospects and numerous entries being made in the government land office by individuals and associations, as well as the organization of several coal companies, and other corporations who have filed their articles of incorporation with the secretary of the territory. Coal has been mined in Johnson County for several years, in the vicinity of Buffalo. Fort McKinney has been supplied from these lines for many years. The coal is a lignite, of very fair quality for domestic purposes. Coal has been discovered, and more or less development made, in every county in the territory.

Mr. P. J. Quealey, Mine Inspector, says: "The quality of Wyoming coals is demonstrated by the fact that our Rock Springs coal is sold in Colorado, where they justly boast of having a native supply of Bituminous and Anthracite coals and also superior grades of lignites. Our coal is also sold as far east as Omaha, Nebraska, being transported over 400 miles to Colorado and over 800 miles to Omaha. According to the estimate we have about 6,800 square miles of coal, more than the state of Pennsylvania. And even in its present primitive state of development, coal mining is the chief industry, and coal export the principal commodity of our territory."

The production in the Territory has been :

Year.	Carbon.	Rock Spring.	Almy.		Twin Creek.	Total.
			U. P. Mines.	C. P. Mines.		
1882.....	200,123	287,510	117,211	94,065	8,855	707,764
1883.....	245,380	304,495	111,713	78,450	36,651	779,689
1884.....	319,883	318,197	150,880	68,471	45,189	902,620
1885.....	220,863	328,601	164,441	70,216	17,207	807,328
1886.....	214,233	359,234	155,547	100,341	.....	829,355

Other mines in Wyoming, did not produce over 5,000 tons in 1886.

## NEW YORK CITY.

The question is often asked, what is the coal consumption of New York? From the peculiar methods of receiving and distributing coal in this vicinity it is almost impossible to give the definite figures. Very careful calculations show that the following may be taken as approximately correct :

	Tons.
Anthracite—for domestic purposes, for manufactures, for steam raising and heating, on the railways and ferries, etc., etc..	3 575 000
Bituminous—for factory, steamship and general uses.....	1,375,000
Gas Coal and Cannel—for house use, etc.....	300,000
Grand total, gross tons.....	5,250,000

Brooklyn and Long Island, it is estimated, take 1,450,000 tons Anthracite and 360,000 tons Bituminous coal.

Jersey City, it is estimated, takes 325,000 tons Anthracite and 150,000 tons Bituminous coal.

Staten Island takes 185,000 tons Anthracite and 40,000 tons Bituminous coal.

It is said that the steamship trade—ocean and coastwise—takes 950,000 tons of Bituminous coal each year. The elevated railroads take nearly 200,000 tons of Anthracite coal. The use of Pea and Buckwheat coal for steam raising has increased to such an extent that the price is now likely to be as high for Pea coal as the larger sizes have sold at in the past year—\$3.00 per ton at New York.

The coal supply for this city is brought in barges from the loading ports on the New Jersey shore, plus some semi-Bituminous coal from Norfolk, Newport News, and Baltimore. The P. R. R. Co., ship at South Amboy ; the Lehigh Valley at Perth Amboy ; the C. R. R. of N. J. at Elizabethport and Port Johnson (the Reading ships at two short docks : their lease is said to terminate on May 1) ; the D. L. and W. at Hoboken ; the Pennsylvania Coal Co., the Erie, and the Delaware and Hudson at Weehawken. The coal is delivered from the barges, oftentimes, in the crudest fashion to both the steamship and the retail trade ; the use of expeditious and economical appliances is not large when one views this important industry in its entirety.

During the strike of the coal handlers in January 1887, there were many ways and means found available for securing a supply of coal to New York and vicinity. Coal was brought into the city all rail by connections of the N. Y. C. and H. R. R. The use of floats also proved of great advantage, and cars from Communipaw, Hoboken and Weehawken were thus delivered at points in this city and Brooklyn. Some modification of either means of supply would cheapen the cost, and avoid many irregularities. The proper coaling of steamships in an expeditious and economical manner, offers a vast field of usefulness to some inventive genius.

## ST. LOUIS, MO.

Receipts during the year 1886 are stated by a correspondent to have been :

	Tons.
Bituminous Coal.....	1,843,395
Coke.....	94,036
Anthracite Coal.....	96,640
Total.....	2,034,071

Mr. G. H. Morgan gives the following as the receipts by various lines, in bushels, and comparatively with preceding years.

Railways.	Bushels.
Ohio and Mississippi.....	5,405,250
Indiana and St. Louis.....	4,330,725
St. Louis, Vandalia and T. H.....	9,128,425
Cairo Short Line.....	11,813,100
Wabash.....	12,314,500
Louisville and Nashville.....	5,395,250
Illinois and St. Louis.....	6,102,075
St. Louis and Iron Mountain.....	933,800
Ohio River (Pittsburgh).....	1,996,850
St. Louis County—estimated.....	250,000
C. A. & St. L.....	2,026,100
Mobile and Ohio.....	1,475,625
Tol., St. L. & K. C.....	77,025
Missouri Pacific.....	9,450
Total.....	61,258,525

This, 25 to the ton of 2,000 lbs., shows 2,450,341 tons, and is doubtless more complete than the figures first above given.

A recapitulation of the coal trade is given below.

Year	Bushels.	Year.	Bushels.
1882.....	47,750,375	1885.....	53,387,064
1883.....	50,687,225	1886.....	61,258,525
1884.....	52,049,600		

## NEW ORLEANS, LA.

The coal brought to this market is almost exclusively Pittsburgh coal. The flats and barges are towed by powerful tow-boats built expressly for that purpose. The towing between Pittsburgh and Louisville depends on the state of the river. The coal flats and barges sent to New Orleans are generally dropped at Willow Grove, near Greenville, just above the city, where they are superintended for the owners or agents. When a boat or barge is wanted, a small

tug boat is sent to tow it to the city, or to its destination on the coast. The distance from Pittsburgh to New Orleans is some 2,000 miles, and the cost of towing, say three cents per bushel, and this in addition to the high cost at Pittsburgh, makes it necessary to have a better rate at the lower ports than ruled last season to make the business profitable. The arrivals for the year 1886 were 503 boats and 92 barges, and the consumption is put at 473 boats and 71 barges. Average price 28 cents per barrel. Eleven barrels to a ton of 2,000 lbs. nearly. The coal sent to planters below the city is included in the consumption. Our returns for 1886 are for the calendar year, and for the preceding years, with Nov. 30. The Pittsburgh coal shippers have now an organization at New Orleans for handling their coal instead of through jobbers, and a better result is looked for. Taking boats at 9,500 barrels, and barges at 5,000 barrels, the arrivals were 5,710,500 barrels of Pittsburgh coal, and the sales were 4,539,000, so that there was a stock on hand, January 1st, 1887, of 181,500 barrels.

Comparative Statement of Consumption.

Year.	Bbls.	Year.	Bbls.
1882.....	3,284,000	1885.....	3,995,650
1883.....	3,759,250	1886.....	4,529,000
1884.....	3,864,300		

SAN FRANCISCO, CAL.

The total receipts during the five years were :

Year.	Tons.	Year.	Tons.
1882.....	882,896	1885.....	959,246
1883.....	869,615	1886.....	1,011,867
1884.....	987,151		

Details by qualities in the past three years were :

	1884.	1885.	1886.
Australian.....	153,192	167,567	198,081
English, Welsh, etc.....	138,295	182,998	166,937
Vancouver's.....	254,202	217,848	183,056
Anthracite.....	13,486	21,000	5,115
Cumberland.....	25,047	8,035	12,243
Mt. Diablo.....	77,485	71,615	90,664
Coos Bay and Renton.....	25,217	27,699	42,168
Seattle, W. T.....	164,231	170,938	174,561
Tacoma, W. T.....	135,996	157,241	144,579

Arrivals at Wilmington and San Diego are computed in the details above. Coke receipts were 26,293 tons.

The receipts from the coast mines have not been as heavy as their proprie-

tors may have wished, as the low prices prevailing for foreign coal during the greater part of the year necessitated quotations which left little profit for coast mine owner.

### MOBILE, ALABAMA.

The Louisville and Nashville Railroad brought 40,932 tons, of 2,000 lbs., including that used by L. & N. R. R. here at their shops, etc.

The Mobile and Ohio Railroad brought 16,364 tons, during last year, including coal for local use, and for their shop and engine use.

This gives a total of 57,296 net tons of Alabama coal for the year, and the progress has been :

Year.	Tons.	Year.	Tons.
1879.....	3,015	1883.....	25,304
1880.....	5,396	1884.....	37,355
1881.....	8,926	1885.....	69,330
1882.....	22,712	1886.....	57,296

Receipts of Pennsylvania Anthracite coal from Philadelphia and Hoboken, 1,743 tons.

### CLEVELAND, OHIO.

The total receipts foot up as below :

Year.	Tons.	Year.	Tons.
1882.....	1,922,595	1885.....	1,445,152
1883.....	2,089,909	1886.....	1,557,361
1884.....	1,686,112		

Details are as below:

	Tons, 1885.	Tons, 1886.
RECEIPTS, Bituminous .....	1,326,510	1,412,535
Anthracite .....	118,642	144,826
Coke .....	140,000	117,372
Total .....	1,585,152	1,674,733
SHIPMENTS, Anthracite by Rail.....	13,201	20,000
Bituminous by Rail.....	101,892	120,000
Bituminous by Lake .....	397,328	600,000
Total .....	512,421	740,000

The shipments from the Customs district of Cuyahoga, which includes Cleveland, were as below :

*Lake Shipments of Bituminous Coal.*

	1884.	1885.	1886.
To ports in British Provinces.....	189,673	112,568	43,317
To domestic ports.....	926,035	917,713	1,036,467

The round figures only can be given for 1886. There were 240,204 tons loaded as fuel coal on lake steamers during the past season.

DULUTH, MINN.

Year.	Tons.	Year.	Tons.
1882.. .....	264,688	1885.....	695,000
1883.....	335,000	1886.. .....	575,000
1884.....	375,000		

Receipts during 1886 amounted to 250,000 tons of Anthracite and 325,000 tons of Bituminous. This port is growing as a point for the receipt and shipment of Anthracite to the northwest; the falling off last year was only due to the lack of lake transportation. In 1878 the receipts were but 31,000 tons. The business here is in the hands of some of the largest concerns in the country—the Northwestern Fuel Company, the Ohio Coal Company, the Lehigh Iron and Coal Company, and the St. Paul and Pacific Coal Company.

The Northwestern Fuel Co., representing the D. L. & W. Co. and W. L. Scott & Co., use three docks—1,200x400—1,200x200—1,000x800.

The Ohio Coal Co., representing Pennsylvania Coal Co. and the D. & H. Co., use one dock—1,000x300 feet.

St. Paul and Pacific Coal and Iron Co., representing the Philadelphia and Reading Co., use a dock—1,200x400 feet.

The Lehigh Coal and Iron Co. has a dock—1,000x300—and a new one of same dimensions at West Superior. This concern is composed of parties in the Lehigh Valley interest, but the company now proposes to have a dock of its own.

The St. Paul docks are at Connor's Point; the L. V. R. R. will be at Rice's Point; the Lehigh C. & I. Co. at Superior, and their new dock at West Superior.

The coal at West Superior should really be added—150,000 tons last season. This puts the total at 725,000 tons.

The development of the coal business of Duluth in the next two or three years will be one of the greatest surprises to Duluth people and the country generally that the Northwest has yet produced. The receipts of coal here are to be simply enormous, and it is estimated that this year will witness receipts of from 1,200,000 to 1,500,000 tons.

## PITTSBURGH, PA.

Coal prices, 1½ screen, on cars at Union yard, per 100 bushels of 76 lbs., were in the years and months named, as below :

Months.	1882.	1883.	1884.	1885.	1886.
January.....	\$7 50	\$6 50	\$6 25	\$5 25	\$4 25
February.....	7 50	6 50	6 25	5 00	4 25
March.....	7 00	6 50	6 00	5 00	4 25
April.....	7 00	6 00	5 50	*....	4 25
May.....	7 00	6 00	5 00	5 00	4 50
June.....	7 00	6 00	5 00	5 00	4 50
July.....	7 00	5 50	5 00	4 50	4 50
August.....	6 50	5 50	5 25	4 25	4 50
September.....	6 50	5 75	5 25	4 25	4 50
October.....	6 50	6 00	5 50	4 25	4 50
November.....	6 00	6 25	5 50	4 25	4 50
December.....	6 00	6 25	5 50	4 25	4 50
Average.....	6 79	6 06	5 50	4 63	4 41

\* Strike March 8 to May 15. Miners conceded the rate, and then refused to abide thereby ; again a strike and finally, old prices.

Average for five years is \$5.48.

The price paid for mining the coal on which above averages, etc., are given was as below, per 100 bushels :

Months.	1882.	1883.	1884.	1885.	1886.
January.....	\$4 00	\$3 50	\$3 50	\$3 00	\$2 50
February.....	4 00	3 50	3 50	2 50	2 50
March.....	4 00	3 50	3 50	2 50	2 50
April.....	*4 00	3 00	3 00	....	2 50
May.....	4 00	3 00	3 00	2 50	†2 75
June.....	4 00	3 00	3 00	2 50	2 75
July.....	4 00	3 00	3 00	2 50	2 75
August.....	3 50	3 25	3 00	2 50	2 75
September.....	3 50	3 25	3 00	2 50	2 75
October.....	3 50	3 50	3 00	2 50	2 75
November.....	3 50	3 50	3 00	2 50	2 75
December.....	3 50	3 50	3 00	2 50	2 75
Average.....	3 80	3 28	3 12½	2 54	2 66

\* Strike from April 1 to August 15 against reduction from \$4 to \$3.50. Miners accepted reduction.

† In accordance with Columbus, O., agreement equals 71 cents per ton. Average for five years is \$3.08.

## CHARLOTTE, N. Y.

In 1885, there were 176,101 tons Anthracite, and 56,963 tons Bituminous coal shipped at this port, while in 1886, the figures were 198,247 tons Anthracite, and 39,955 tons Bituminous.

## PROVIDENCE, R. I.

Receipts in tons of 2,240 pounds have been as below :

Year.	Tons.	Year.	Tons.
1882.....	821,837	1885.....	870,147
1883.....	869,722	1886.....	1,037,000
1884.....	766,165		

In its importance as a distributing point for coal the city of Providence has diminished in no degree. In fact the movement of coal at this port has exceeded that of any previous year. Vast quantities of the coal landed here have been taken up over the railroads to the various points along their lines in Rhode Island, Massachusetts and Connecticut, the Providence and Worcester road especially handling great amounts. What is needed to still further enlarge the coal trade is improved railroad facilities.

## OSWEGO, N. Y.

In 1884 there were 324,978 tons Anthracite coal shipped at this port ; in 1885 there were 348,360 tons, and in 1886 there were 375,035 tons Anthracite, and 7,654 tons of Bituminous.

## FAIR HAVEN, N. Y.

In 1885 there were 134,000 tons of Anthracite shipped at this port, and in 1886, there were only 56,591 tons.

## KANSAS CITY, MO.

Years.	Receipts.	Shipments.
1886 .....	558,374	152,880
1885.....	533 282	199,476

The proportion of Bituminous to Anthracite used here is about 4 to 1 for domestic purposes. Taking into consideration the factories and such large consumers, the proportion will be much greater. A close estimate places the amount of coal consumed in Kansas City last year at 20,000 car loads. This is outside of that used in the shops, railroads, and packing houses. The parties located here dealing in coal are interested in mines in Missouri, Arkansas, Kansas, Texas, Indian Territory, and to some extent in Iowa and Illinois. Eastern coal has almost entirely disappeared from the market. For this two reasons are given : The first and most probable one is that Western coal is the best and cheapest ; the other is that the patriotism of Western people induces them to burn a home production in preference to that brought in from

the East. Anthracite trade was done at a loss last year ; prices were \$10.50 per ton at wholesale. Coke sold at \$8 for Pittsburgh, and \$3.50 for the local. Bituminous lump sold at \$3.00 per ton.

The shipments for the year have fallen off, but the wholesale trade has improved. This shows an increased local trade, which is said to be due to the growth of the city.

### BALTIMORE, MD.

Trade is growing at this point, as the shipments will prove.

Coal to Locust Point includes Cumberland, George's Creek, and the gas coal from West Virginia mines on line of B. & O. road, and that from Youghiogeny mines in Pennsylvania, on line of the same road, for local use and for northern shipment, and the estimate of 200,000 tons as last years receipts is an accurate one.

Of Anthracite coal received there were something like 225,000 tons per Susquehanna Canal and other water routes, besides 200,000 tons by Northern Central Railroad.

By the annual report of the Baltimore and Ohio Railroad Company for the year ending with September last, it appears that there was an increase in the coal tonnage of the company compared with previous years, the details are :

	Tons, 1884.	Tons, 1885.	Tons, 1886.
Pittsburgh Division.....	2,157,606	2,003,982	2,427,238
Ohio line.....	966,548	909,594	1,329,681
Main stem.....	3,268,521	3,487,170	3,673,448

Pittsburgh tonnage includes coke, but the largest portion of the increase is in coal from the Cumberland district.

The Baltimore and Ohio carried the following to Locust Point :

Year.	Tons.	Year.	Tons.
1882 .....	1,599,939	1885 .....	2,238,097
1883 .....	1,618,416	1886 .....	2,313,783
1884 .....	2,510,389		

The shipment of coal foreign was as below :

Year.	Tons.	Year.	Tons.
1882 .....	55,167	1885 .....	71,527
1883 .....	63,526	1886 .....	64,477
1884 .....	59,289		

The Northern Central Railroad carried the following coal to the piers at Canton :

Year.	Tons.	Year.	Tons.
1882 .....	527,778	1885 .....	850,303
1883 .....	693,494	1886 .....	818,863
1884 .....	767,381		

### MILWAUKEE, WIS.

Milwaukee has made rapid progress towards being a great coal depot. Had it not been for the scarcity of vessels during the latter part of last season, we would have had at least 100,000 tons more to report. In consequence of this very large shortage almost every dealer and consumer will be ready upon the opening of navigation to receive coal. Were it not for the present railroad facilities our manufacturing interests would have suffered materially, on account of the short supply of soft coal which should have been forwarded by water :

The receipts of coal for the past five years are as follows :

	1882.	1883.	1884.	1885.	1886.
By Lake.....	510,493	550,861	623,018	697,052	721,187
By Rail.....	83,349	61,723	81,148	65,014	60,000
Total .....	593,842	612,584	704,166	762,066	781,187

The amounts received during 1886, notwithstanding the impossibility of getting vessel transportation was in excess of 1885 nearly 20,000 tons. Had there been secured what had actually been contracted to have been delivered here during the period of navigation, we should have recorded at least 875,000 tons. Of the amount received during 1886, 312,580 tons were soft and 468,607 tons were hard coal.

### ERIE, PA.

There is a business done in coal at this city of say 625,000 tons per annum ; the consumption amounts to 200,000 tons, and the remainder is forwarded West by rail and vessels from this city.

Business for 1886 has been :

Receipts.	Anthracite.	Bituminous.
By Pa. R. R.....	317,277	25,320
By E. & P. R. R.....	.....	162 607
By L. S. & M. S. R. R .....	.....	115,000
Total.....	317,277	302,927

Shipments.	Anthracite.	Bituminous.
By Lake.....	107,406	127,849
By Rail.....	166,748	.....
Local Use.....	43,123	175,075
Total.....	317,277	302,927

Coal for locomotive purposes not included.

#### MONTREAL, PQ.

Anthracite coal continues to reach this city in increasing quantity, notwithstanding the duty of 50 cents per ton levied thereon, as the following figures will show :—

	Tons, 1884.	Tons, 1885.	Tons, 1886.
Anthracite from United States.....	223,728	190,000	194,219
Bituminous from Great Britain.....	52,109	50,000	40,000
Bituminous from Nova Scotia.....	275,000	300,000	312,000

Montreal is the best customer Nova Scotia has for the product of her coal mines. But little Bituminous from the United States reaches Montreal, for the duty is 60 cents per ton, and that keeps this market for the Provincial coal. There has been soft coal from the United States sent as far as Brockville by rail however.

#### LOUISVILLE, KY.

The following statement shows the consumption of all kinds of coal and coke around the Falls at Louisville :

	Tons, 1885.	Tons, 1886.
Pittsburgh coal by river.....	539,628	575,000
Ohio River and Kanawha coal by river.....	86,348	90,000
Total, coal by river.....	625,976	665,000
Bituminous coal by rail.....	305,960	200,671
Anthracite by rail.....	9,300	4,341
Coke.....	40,306	50,000
Total coal—tons of 2,000 lbs.....	941,236	920,012

#### BUFFALO, N. Y.

Shipments of Anthracite by lake foot up as below :

Year.	Tons.	Year.	Tons.
1882.....	995,500	1885.....	1,428,086
1883.....	1,467,778	1886.....	1,531,210
1884.....	1,431,081		

Details of receipts show the following :

BLOSSBURG.			Bituminous.		Anthracite.	
Year.	By Rail.	By Canal.	By Lake.	By Rail.	By Canal.	By Rail.
1882 .....	65,000	.....	8,880	1,024,807	233,004	1,700,000
1883 .....	70,000	500	4,500	1,467,929	163,042	1,916,000
1884 .....	70,000	.....	830	1,920,524	151,671	2,299,729
1885 .....	31,000	.....	520	1,500,538	180,348	2,796,584
1886 .....	30,000	.....	500	1,420,455	81,445	2,592,333

Below will be found the fluctuations in prices of Anthracite coal, per gross ton, on cars at Buffalo :

	Grate.	Egg.	Stove.	Chestnut.
January 1.....	\$4 40	\$4 50	\$4 95	\$4 95
April 14.....	4 00	4 00	4 25	4 25
August 1.....	4 15	4 15	4 40	4 40
September 1.....	4 40	4 40	4 65	4 65
October 1.....	4 65	4 65	4 90	4 90

and continued until the close of the year. The f. o. b. prices were 30 cents per ton additional.

The range of prices during 1886 for Bituminous, delivered to manufactories, gas works, propeller lines, etc., was from \$1.25 to \$3.00 per ton, according to description. The price at retail varied from \$5.00 to \$6.00, delivered per ton, according to quality, for family use.

Below are details of clearances last season :

Ports.	Tons.	Ports.	Tons.
Chicago .....	642,135	Hancock.....	4,200
Milwaukee.....	376,615	Ashland .....	4,100
Duluth .....	157,420	Port Arthur.....	3,287
Superior City .....	65,090	Kincardine.....	2,840
Toledo.....	55,290	Es-canaba.....	2,705
Detroit .....	31,090	Menominee.....	2,600
Racine.....	25,263	Fort William .....	1,900
Green Bay.....	23,870	St. Joseph's.....	1,730
Marquette .....	13,580	Muskegon .....	1,710
Saginaw .....	11,660	Manitowac .....	1,710
Sheboygan.....	11,580	Evanston .....	1,430
Washburn.....	10,290	Houghton .....	1,350
Sandusky.....	7,720	Amherstburg.....	1,050
Kenosha.....	6,280	St. St. Marie.....	1,030
Port Huron.....	4,950	27 smaller lots, aggregating	10,822
Windsor.....	4,940	Miscellaneous, from Tona	
Bay City.....	4,640	wanda .....	67,663

The total of above is 1,531,210 tons.

Mr. William Thurston furnishes the following statement :

	Tons, 1884.	Tons, 1885.	Tons, 1886.
Total imports, Anthracite.....	2,451,410	2,976,932	2,673,778
Total imports, Bituminous.....	1,921,354	1,501,058	1,420,955
Total imports, Blossburg.....	70,000	31,000	30,000
Total exports, Bituminous.....	31,958	27,032	19,076
Total exports, Anthracite.....	1,350,410	1,496,000	1,552,060
Total exports, Blossburg.....	12,000	10,000	10,000

Below are the freights on Anthracite during the season :

1806—Date.	Chicago.	Milwaukee.	Duluth.	Green Bay.	Toledo,	Racine.
April 28.....	\$0.50	\$0.50	\$0.50	.....	\$0.25	.....
May 5.....	.50	.45	.35	\$0.55	.25	\$0.55
May 12.....	.50—.55	.50—.55	.35—.40	.45—.50	.25	.55—.60
May 19.....	.50—.55	.50—.55	.35—.40	.45—.50	.25	.65
May 26.....	.55—.60	.55—.60	.40	.....	.25—.20	.60
June 2.....	.55—.60	.55—.60	.....	.55—.60	.20	.60
June 9.....	.60	.60	.50	.....	.20	.65
June 16.....	.60	.60	.40	.60	.20	.55
June 23.....	.65—.70	.60—.70	.40	.70	.....	.70
June 30.....	.70	.70	.....	.70	.20	.70
July 7.....	.70	.70	.45	.70	.....	.....
July 14.....	.70—.60	.70—.60	.45	.60	.....	.....
July 21.....	.60	.60	.45	.60	.20	.60
July 28.....	.60—.65	.60—.65	.45	.60	.20	.....
August 4.....	.60	.60	.....	.....	.20	.....
August 11.....	.60	.60	.45	.60	.....	.70
August 18.....	.60—.70	.60—.70	.45	.60	.20	.70
August 25.....	.70	.70	pt.	.70	.20	.75
September 1.....	.75	.75	.50	.70	.20	.....
September 8.....	.75	.75	.65—.60	.70	.20	.85
September 15.....	.75	.75	.60	.....	.20	.85
September 22.....	.75	.75	.60	.75	.20	.....
September 29.....	.80—1.00	.80—1.00	.60	.70	.20	.....
October 6.....	1.00	1.00	.60	1.00	.20	1.00
October 13.....	1.00—.90	1.00—.90	.....	.....	.20	.....
October 20.....	.90—1.00	.90—1.00	.90—.95	.90	.20	1.00
October 27.....	1.00	1.00	.65	.....	.20—.25	.....
November 3.....	1.00	1.00	.70—.75	.90	.30	1.15
November 10.....	1.00—1.40	1.00—1.40	.75—1.00	.....	.30—.45	1.50
November 17.....	1.45—1.50	1.45—1.50	1.00—1.25	1.50	.60	.....
November 24.....	1.50	1.50	.....	.....	.60	.....

We are furnished the following statement showing the movement of Anthracite coal west from Buffalo, during 1884-5-6, by rail. Via L. S. & M. S.; M. C.; G. T., and N. Y. C. & St. L. railroads, in tons of 2,000 lbs.

Destination.	Tons, 1884.	Tons, 1885.	Tons, 1886.
Detroit.....	116,843	106,471	69,552
Chicago and beyond.....	336,954	409,319	336,794
St. Louis.....	57,205	61,367	25,545
Illinois.....	80,083	117,405	111,785
Michigan and Indiana.....	181,873	249,492	254,994
Toledo, Cincinnati and Ohio west of Columbus.....	70,054	82,416	62,011
Totals.....	843,112	1,026,450	849,681

## CHICAGO, ILL.

Receipts have been as below :

Year.	Tons.	Year.	Tons.
1882.....	3,937,664	1885.....	4,858,498
1883.....	4,546,772	1886.....	4,888,090
1884.....	4,794,386		

Lake receipts have footed up :

Year.	Anthracite.	Bituminous.
1882.....	633,785	287,794
1883.....	738,723	214,488
1884.....	825,276	209,595
1885.....	741,864	206,817
1886.....	768,164	241,090

Details of the several qualities :

	1884.	1885.	1886.
Anthracite.....	1,447,808	1,354,920	1,385,161
Pa. & W. Va. Bituminous.....	400,710	492,332	446,349
Ohio.....	454,940	504,654	609,184
Illinois.....	1,264,433	1,304,575	1,175,001
Indiana.....	672,635	643,054	732,191
Coke.....	553,860	558,963	540,204
Total.....	4,794,386	4,858,498	4,888,090

Shipments were as below :

	1884.	1885.	1886.
Anthracite.....	585,753	632,274	451,869
Bituminous and Coke.....	666,574	700,366	539,184
Total.....	1,252,327	1,332,640	991,053

As showing the fluctuations of soft coal on the Chicago market, the following schedule, per net ton, is appended :

	Jan. 1.	April 1.	July 1.	Oct. 1.	Dec. 29.
Erie.....	\$4 15	\$4 15	\$4 15	\$4 15	\$4 75
Pittsburgh.....	3 30	3 15	3 15	3 25	3 40
Hocking Valley.....	3 00	2 90	2 90	2 90	3 20
Indiana.....	2 40	2 40	2 50	2 40	2 65
Wilmington.....	2 15	2 10	2 00	2 00	2 25
Coke.....	4 50	4 50	5 00	5 00	5 00

Anthracite wholesale prices per gross ton were :

	Grate.	Egg.	Stove.	Nut.
January 1 .....	5 70	5 80	6 20	6 20
April 14.....	5 60	5 60	5 88	5 88
August 1.....	5 75	5 75	6 03	6 03
September 1.....	5 87	5 87	6 16	6 16
October 1.....	6 15	6 15	6 45	6 45

and continued until the close of the year.

Distribution of the Anthracite received :

ANTHRACITE.	1884.	1885.	1886.
Stock, Jan. 1.....	265,645	324,289	223,518
Receipts.....	1,447,808	1,354,920	1,385,161
Total.....	1,713,453	1,679,209	1,608,679
Stock, Dec. 31.....	324,289	223,518	118,059
Net Business.....	1,389,164	1,455,691	1,490,620
Out Shipments.....	585,753	632,274	451,869
"Consumption".....	803,411	823,417	1,038,751

### CINCINNATI, OHIO.

Receipts at this point during 1886, were greater than in any other year. Pittsburgh shipments were 33,229,000 bushels as against 32,590,000 ; the shipments from the Kanawha were also greater, owing to the enterprise of the Winifrede company. Anthracite receipts, 55,000 tons. Connellsville coke, 150,000 tons. Prices were low all the year until early in November, when 16c. per bushel was reached, owing to the scarcity. During July, August, September and October, the shipments were only 1,800,000 bushels out from Pittsburgh to all southern points. The opening price was 5c. @ 6c. per bushel ; 7c. in September, and closed at 7c. per bushel for second pool, and 6c. for fourth pool. Prices to consumers were as follows, delivered : Pittsburgh, \$3.33 per ton ; Kanawha River, \$3.06 @ \$3.33 per ton ; Ohio River, \$2.78 per ton ; Anthracite, \$6.50 @ \$7.00 per ton.

Receipts of coal at this city have been as below, in the several years named ending with Aug. 31st :—

Year.	Tons.	Year.	Tons.
1881.....	1,492,817	1884.....	2,092,551
1882.....	2,197,407	1885.....	2,008,850
1883.....	2,025,859	1886.....	2,100,000

## TOLEDO, OHIO.

The receipts of coal at Toledo have been as below :

Year.	Tons.	Year.	Tons.
1880.....	441,212	1883.....	2,255,628
1881.....	709,702	1884.....	1,908,181
1882.....	1,839,450	1885.....	2,092,421

The growth of the trade is remarkable, and is largely due to the enterprise of the Columbus, Hocking Valley and Toledo Railway.

The Anthracite is received by lake and amounted to 87,120 tons last year.

Receipts during the calendar year 1886 were 2,340,859 net tons, by the following routes :

C. H. V. & T.....	1,039,200	Toledo & S.....	15,832
Ohio Central.....	404,684	Wabash.....	12,598
W. & L. E.....	391,086	C. H. & D.....	8,198
Penna.....	201,427	W. C. R.....	9,524
L. S. & N. S.....	165,382	T. S. L. & K. C.....	3,828
Lake (Anth.).....	87,120	T. & A. A.....	1,910

## BOSTON, MASS.

The receipts of coal at this port have been, in gross tons, as per the totals herewith. The amount given includes coal not only for local use, but for the supply of points upon the various lines of railway centering or having their terminus here.

Year.	Tons.	Year.	Tons.
1882.....	2,106,870	1885.....	2,221,220
1883.....	2,273,068	1886.....	2,500,000
1884.....	2,225,740		

Receipts at this point during the year 1886 were above those of the previous year's total, and the qualities used changed very materially. The consumption of soft coal is increasing in the mills and factories of the Eastern States, and will no doubt, from its low cost, continue to increase, as sales have been made within the range of \$3.15 to \$3.50, delivered at Boston for first-class semi-Bituminous coal. It is a noticeable fact that this very cheapness of our own coals keeps out the foreign coal, only 15,000 tons of Nova Scotia having been received last year, and that "culm," whereas twenty years ago, when the total receipts were a third of what they now range at, there was something like two hundred thousand tons of this quantity that was foreign coal.

PENNSYLVANIA RAILROAD'S ANTHRACITE COLLIERIES.

The output at the collieries known by this title during 1886 was : Susquehanna Coal Co., 1,631,850 tons ; the Mineral R. R. Co., 290,736 tons ; the Summit Branch, 172,282 tons ; the Lykens Valley, 185,692 tons, making a total of 2,280,560 gross tons of Anthracite coal. The average net price at the mines was \$1.44 for the Susquehanna, \$1.73 for the Mineral R. R., \$2.55 for the Summit Branch, and \$2.39 for the Lykens Valley coal.

Percentages during 1886, were as follows :

Sizes.	Susq. C. Co.	Mineral.	Summit.	Lykens Valley.
Lump.....	06.9	.....	.....	.....
Broken.....	08.2	.....	12.80	11.60
Egg.....	13.3	13.39	19.50	18.40
Stove.....	33.3	36.01	26.30	22.90
Chestnut.....	17.5	22.62	18.30	15.10
Pea.....	12.1	22.82	14.40	22.00
Buckwheat.....	08.7	05.16	8.70	10.00
Totals.....	100.0	100.00	100.00	100.00

PHILADELPHIA AND ERIE R. R. COAL TRADE.

Years, December 31.	Tons, 1885.	Tons, 1886.
Anthracite.....	922,594	919,232
Bituminous.....	1,767,269	1,988,343
Tons of 2,000 lbs.....	2,689,863	2,907,575

NORTHERN PACIFIC COAL CO.

The production of coal at the mines of this company during the year 1886, was:

	Tons.
Sims, Dakota.....	20,956
Trinberline, Montana.....	45,445
Roslyn, Washington.....	1,670

PERCENTAGES OF LEHIGH COAL.

In the annual report of the Lehigh Coal and Navigation Company for last year, we find the following figures given as the percentages :

Lump.....	9.58	Stove.....	13.46
Steamer.....	.14	Chestnut.....	18.76
Broken.....	16.41	Pea.....	11.65
Egg.....	15.83	Buckwheat.....	14.17

## MISSOURI PACIFIC COAL TRADE.

	Tons, 1884.	Tons, 1885.	Tons, 1886.
Coal mined on lines .....	1,002,972	1,031,180	1,172,052
Received from connections .....	514,287	468,817	544,796
Total .....	1,517,259	1,499,997	1,716,848
Commercial coal carried .....	601,820	629,551	877,510
For Company use .....	915,439	870,446	839,338
Cost per ton .....	\$2 24	\$1 80	\$1.74

This company owns a controlling interest in the Lexington and Rich Hill Coal Companies, of Missouri; owns the Osage Coal and Mining Company in the Indian Territory and Missouri; they also own mines in Crawford and Cherokee counties, Kansas; the Minden Coal Company, in Barton County, Mo.

## COAL TRADE OF THE NEW YORK CANALS.

The quantity carried on the State canals, in both directions, East and West, is stated by the Canal Auditor, to be as below :

Quality—Tons 2,000 lbs.	1884.	1885.	1886.
Anthracite .....	887,975	970,439	800,360
Bituminous .....	66,317	55,511	57,524

## LOUISVILLE AND NASHVILLE RAILROAD COAL TRADE.

The following statement is for the fiscal year ending June 30th, 1886 :

	Tons.
From mines on Knoxville Division .....	294,670
From mines on Henderson Division .....	274,552
From mines on O. & N. Railway .....	78,861
Grand total from mines in Kentucky .....	648,083

It should be understood that shipments from Knoxville Division are from what are termed "Laurel" and "Jellico" mines, which are in the southeastern coal fields of Kentucky. The shipments from Henderson Division and Owensboro and Nashville Railway are from the western Kentucky coal fields.

## MINES IN ALABAMA.

The total number of tons shipped from mines on the South and North Alabama Railroad was 302,535 tons.

The deliveries to principal points for the same period were as follows :

	Knoxville Division.	Henderson Division.	O. & N.	Total from Ky. mines.	Total from Ala. mines.	Grand Total.
Louisville . . .	91,013			91,013		91,013
Nashville . . . .	6,106	71,946	12,885	90,937	13,330	104,267
Montgomery . . . . .					54,436	54,436
Mobile . . . . .					10,376	10,376
New Orleans . . . . .					14,864	14,864
Memphis . . . . .		31,431	672	32,123		32,123
Pensacola . . . . .					3,365	3,365
Total . . .	97,119	103,397	13,557	214,073	96,371	310,444

The receipts at these points as above indicated cover strictly commercial coal, that is they do not include coal forwarded to the several points for this company's consumption.

The shipments shown from Knoxville Division mines include shipments from mines on the Kentucky and Tennessee State line, *i. e.* Jellico.

## BALTIMORE AND OHIO RAILROAD COAL TRADE.

The coal tonnage of the Baltimore and Ohio Railroad for the fiscal year ending September 30, was :

Tons of Coal and Coke. Main Stem.	1883.	1884.	1885.	1886.
To Baltimore . . . . .	1,654,821		( 2,288,949	2,237,448
Local and West . . . .	517,041	2,828,609	) 754,677	946,639
For company . . . . .	409,695	439,912	443,544	483,360
Total . . . . .	2,581,557	3,268,521	3,487,170	3,673,448
Pittsburgh Div . . . .	2,402,130	2,157,606	2,003,982	2,427,238
Trans Ohio lines . . .	684,696	966,548	909,594	1,329,681
All lines . . . . .	5,668,383	6,392,675	6,400,746	7,430,367

## UNION PACIFIC RAILROAD COAL TRADE.

During the year 1886 there were mined at collieries owned and operated by this corporation, 811,515 tons, divided as follows :

	Tons.		Tons.
At Carbon, Wyoming Territ'y.	214,233	At Grass Creek, Utah . . . . .	29,138
At Rock Spring, " . . . .	359,234	At Como, Colorado . . . . .	23,517
At Almy " . . . . .	155,547	At Baldwin " . . . . .	29,846

## OPENING OF LAKE NAVIGATION.

Year.	Date.	Year.	Date.
1881.....	May 4	1884.....	April 24
1882.....	April 5	1885.....	April 29
1883.....	April 25	1886.....	April 26

## OPENING OF THE ERIE CANAL.

Year.	Opened.	Closed.	Days Open.
1881.....	May 17	Dec. 8	206
1882.....	April 11	Dec. 6	240
1883.....	May 7	Dec. 1	209
1884.....	May 6	Dec. 1	210
1885.....	May 11	Dec. 1	205
1886.....	May 1	Dec. 1	215

## NORTHERN CENTRAL R. R. COAL TRADE.

Years, December 31.	Tons, 1885.	Tons, 1886.
Anthracite.....	3,201,502	2,936,409
Bituminous .....	1,289,119	1,365,438
Tons of 2,000 lbs.....	4,490,621	4,301,847

## THROUGH THE SAULT.

Coal traffic for 1885-'86 through St. Mary's Falls Canal, Mich. :

Month.	Year 1885.	Year 1886.
April.....	.....	11,190
May.....	91,007	129,990
June.....	135,996	112,990
July.....	182,841	137,672
August.....	151,223	162,761
September.....	143,144	169,986
October.....	111,327	183,597
November.....	79,453	101,813
Totals, net tons of 2,000 lbs.....	894,991	1,009,999

Canal opened May 6, 1885 ; April 25, 1886.

The business to the Upper Lakes is vastly increasing, as the statistics show. Previous to the year 1879, there were not over 100,000 tons annually passing

through the Saint Mary's Falls Canal. We give below a few figures collated from the report of the Chief of Engineers in charge :

Year.	Tons.	Year.	Tons.
1879.....	110,704	1883.....	714,444
1880.....	170,501	1884.....	706,379
1881.....	295,647	1885.....	894,991
1882.....	430,184	1886.....	1,009,999

#### ATCHISON, TOPEKA AND SANTA FE RAILROAD COAL TRADE.

During the year 1886 the allied coal companies controlled by this corporation shipped 712,397 tons of coal, as below :

Canon City Coal Company, Rockvale, Colo.....	211,406
Trinidad Coal and Coking Company, Starkville, Colo.....	146,015
Raton Coal and Coke Company, Raton, New Mexico.....	87,706
San Pedro Coal and Coke Company, Carthage, N.M.....	68,038
Osage Carbon Company, Osage City, Kansas.....	199,232

Trinidad Company also made and shipped 27,072 tons coke. The San Pedro made 10,235 tons of coke in 1886.

#### OHIO COAL BY COUNTIES—1886.

Hon. T. B. Bancroft furnishes the following as the total output of the several counties in the State of Ohio during the past year :

Counties.	Tons.	Counties.	Tons.
Athens.....	899,046	Meigs.....	192,263
Belmont.....	573,779	Muskingum.....	96,601
Columbiana.....	336,063	Mahoning.....	313,040
Coshocton.....	52,934	Morgan.....	4,370
Carroll.....	216,630	Noble.....	3,342
Guernsey.....	433,800	Perry.....	1,607,666
Gallia.....	17,424	Portage.....	70,339
Holmes.....	12,670	Starke.....	593,422
Hocking.....	741,571	Summit.....	82,225
Harrison.....	5,509	Tuscarawas.....	267,666
Jackson.....	856,740	Trumbull.....	188,531
Jefferson.....	275,666	Vinton.....	60,013
Lawrence.....	166,933	Wayne.....	109,057
Medina.....	252,411	Washington.....	5,500

#### THE QUANTITY OF COAL PER ACRE.

The London *Colliery Guardian*:—A summary way of reckoning the quantity of available coal in a given area of a seam is to take an acre of coal one inch thick to contain 100 tons ; this leaves a sufficient margin for faults and losses.

Thus, a seam of coal twenty-four inches thick will yield 2,400 tons to the acre. The exact weight of coal in the seam can be gathered only by taking the specific gravity of the coal into consideration. Where the specific gravity is 1.15 the quantity or weight in the natural bed, would be per acre, per inch of thickness  $116\frac{475}{1000}$  tons, which multiplied by the number of inches, would give the quantity in tons per acre.

#### ALABAMA—1886.

Prof. E. A. Smith sends us the following figures of coal produced by many of the operations in this State during last year :

Companies.	Tons.	Companies.	Tons.
Coosa Coal & Coke Co....	56,350	Warrior C. & C. Co.....	62,410
St. Clair Coal Co.....	15,610	Watts C. & I. Co.....	18,100
Monteceallo Mines.....	38,153	Brake Mines.....	43,750
Cahaba Coal Co.....	124,206	Pierce Warrior C. Co.....	60,000
Brierfield C. & I. Co.....	75,000	Coalburg C. & C. Co.....	186,000
Hoen's Mines.....	32,659	Milner C. & R. Co.....	60,000
Mabel Mining Co.....	30,000	Woodward Iron Co.....	107,112

#### OUTPUT OF COAL PER MAN PER YEAR.

A German writer sets out the efficiency or annual output of coal per man employed above and below ground for the year 1884, as follows :—England, 336 tons ; Germany, (Rhenish-Westphalian and Silesian basin), 266 tons ; France 190 tons ; Austria-Hungary, 180 tons ; and Belgium (Liege district only), 173 tons. The mean of these figures is 229 tons. Only England and Germany are above this mean. The greater efficiency of the British miner is due in part to superior natural advantages in the condition of the seams. These figures are useful in estimating the relative cost of raising coal in the several European countries. But it must not be forgotten that a considerable improvement in this direction has taken place since 1884. The efficiency of the Continental miner has constantly increased during the last few years. The greater development of the industry, and the need for economy occasioned by growing competition have led to a more efficient employment of labor.

The three Pennsylvania manufacturing cities—Bethlehem, Harrisburg and Scranton—are necessarily large consumers of coal and coke. As a total for last year, we have : Bethlehem, 540,000 tons of all kinds of coal and coke ; Harrisburg, 520,000 tons, and Scranton, 415,000 tons.

# The Coal Trade.

This is the title of our annual publication. It is truly a compendium of valuable information relative to coal production, prices, transportation, etc., etc., at home and abroad. Trade at all the principal cities of the Union, production of the States, districts, etc. Analysis of coals. Every yearly edition contains facts not presented previously, and therefore it is well to have the several volumes that have appeared. Price fifty cents per copy. The edition of 1887 is the fourteenth consecutive yearly edition, and should be in the hands of all interested in coal mining, transportation or selling.

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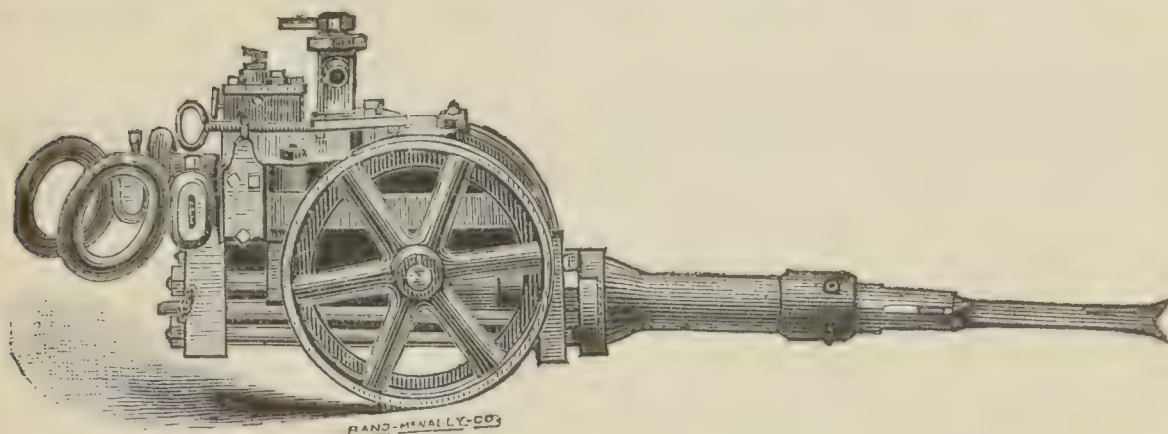
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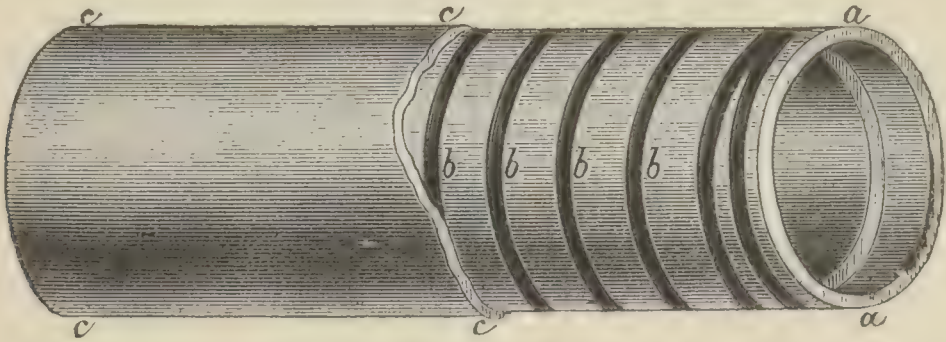
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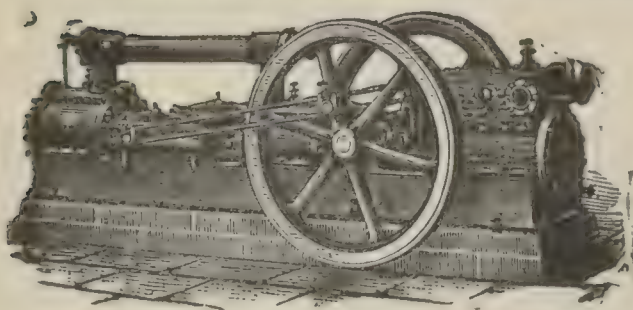
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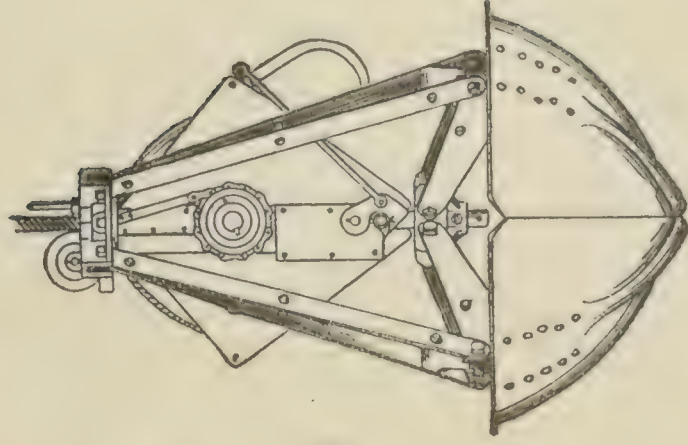
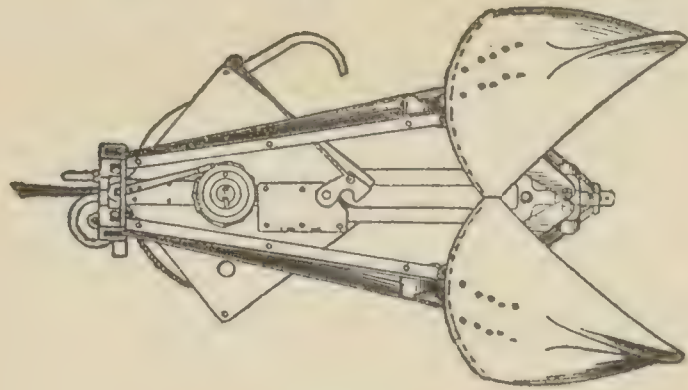
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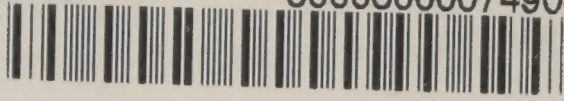
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